

~~SECRET~~

Nº

3

Economic Research Aid

COMPARISON OF SOVIET AND US PRICES
FOR ELECTRONIC EQUIPMENT
1955



CIA/RR A.ERA 62-8

October 1962

CENTRAL INTELLIGENCE AGENCY
Office of Research and Reports

~~SECRET~~

GROUP 1
Excluded from automatic
downgrading and
declassification

~~SECRET~~

Economic Research Aid

COMPARISON OF SOVIET AND US PRICES
FOR ELECTRONIC EQUIPMENT
1955

CIA/RR A.ERA 62-8

WARNING

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, USC, Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

CENTRAL INTELLIGENCE AGENCY
Office of Research and Reports

~~SECRET~~

S-E-C-R-E-T

FOREWORD

Presented in this research aid are the ruble prices and specifications for selected commodities produced by the electronics industry of the USSR in 1955, the dollar prices for comparable products produced in the US, and a brief analysis of the ruble-dollar price ratios and statistical averages derived from these comparisons.

Although a primary reason for undertaking this study was to provide an improved basis for developing military estimates, the averages presented here do not represent in themselves true approximations of ruble-dollar conversion rates for military electronic goods. These averages, however, do represent in a meaningful way a body of statistical data that is based on direct primary source materials of high validity, and, as such, they may serve as a major input into any subsequent synthesis of ruble-dollar conversion factors for the various subsectors of military equipment.

The information in this research aid is supplemental to that of all previous studies on ruble-dollar ratios prepared by this Office. Although these previous studies contain a much broader sampling of producers' commodities, they do not include a sampling of electronic commodity comparisons, thus effectively negating their usefulness in analysis of the electronics industry. In view of the uniqueness of the data, this research aid is being published to permit broader dissemination among other interested consumers.

S-E-C-R-E-T

S-E-C-R-E-T

CONTENTS

	<u>Page</u>
Summary	1
I. General	7
II. Coverage and Representativeness of Sample	8
III. Sources and Methods	12
IV. Prices	13
V. Matching Criteria	14
VI. Frequency Distribution	15
VII. Selection of a Representative Measure	15
A. Unweighted Average	15
B. Weighted Average.	16
VIII. Military Measure	19
IX. Product Categories: General Comments	20
A. Electronic Instruments (SIC Code 3611)	20
B. Radio and Television Receiving Sets (SIC Code 3651)	21
C. Telephone and Telegraph Apparatus (SIC Code 3661)	23
D. Radio and Television Communication Equipment (SIC Code 3662)	23
E. Electron Tubes: Receiving Type (SIC Code 3671); Cathode Ray Type (SIC Code 3672); and Transmitting, Industrial, and Special-Purpose Type (SIC Code 3673)	24
F. Electronic Components (SIC Code 3679)	25

Appendixes

Appendix A. Statistical Tables	27
Appendix B. Source References	57

Tables

1. USSR and US: Frequency Distribution of Ruble-Dollar Price Ratios in the Electronics Industry, by 4-Digit Classification, 1955	3
--	---

- v -

S-E-C-R-E-T

S-E-C-R-E-T

Page

2. USSR and US: Statistical Measures of Ruble-Dollar Price Ratios in the Electronics Industry, by 4-Digit Classification, 1955	4
3. USSR and US: Aggregate Weighted Averages for the Non-military Sector of the Electronics Industry, Including Weights and Measures Used in Their Derivation, 1955 . .	5
4. US: Composition of the Nonmilitary Sector of the Electronics Industry and Value of Shipments for 4-Digit and 5-Digit Product Categories, 1954	10
5. USSR and US: Value Weights for Product Categories of Equipment in the Electronics Industry, by 4-Digit Classification, 1954	18
6. USSR and US: Application of Weighting Formulas in Computation of Aggregate Weighted Averages in the Electronics Industry, 1955	29
7. USSR and US: Electronic Instruments (SIC Code 3611) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955 .	31
8. USSR and US: Radio and Television Receiving Sets (SIC Code 3651) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	37
9. USSR and US: Telephone and Telegraph Apparatus (SIC Code 3661) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	38
10. USSR and US: Radio and Television Communication Equipment (SIC Code 3662) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	44
11. USSR and US: Radio and Television Receiving-Type Electron Tubes (SIC Code 3671) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	47

- vii -

S-E-C-R-E-T

S-E-C-R-E-T

	<u>Page</u>
12. USSR and US: Cathode Ray Type Electron Tubes (SIC Code 3672) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	50
13. USSR and US: Transmitting, Industrial, and Special-Purpose Electron Tubes (SIC Code 3673) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955	51
14. USSR and US: Electronic Components (SIC Code 3679) -- Specifications, Prices, and Ruble-Dollar Ratios, 1955 .	54

Charts

Figure 1. USSR and US: Frequency Distribution of All Ruble-Dollar Ratios for the Electronics Industry for 1955 <u>following page</u>	2
Figure 2. USSR and US: Frequency Distribution of Ruble-Dollar Ratios for the Electronics Industry for 1955, by 4-Digit Classification <u>following page</u>	2

S-E-C-R-E-T

S-E-C-R-E-T

COMPARISON OF SOVIET AND US PRICES FOR ELECTRONIC EQUIPMENT*
1955

Summary

In the nonmilitary electronics manufacturing sector of Soviet industry for 1955, the dollar is equal to 9.3 rubles** as measured by the weighted arithmetic mean average, using US weights; using Soviet weights, it is equal to 8.8 rubles. The geometric mean of the two is equal to 9.0 rubles per dollar. When unweighted averages are used, the results are somewhat different. The dollar is equal to 5.6 rubles as measured by the median, 5.7 rubles as measured by the geometric mean of the unweighted values, and about 7.3 rubles as measured by the arithmetic mean -- that is, the ruble is equal to about 18 cents for both the median and the geometric mean of the unweighted values and about 14 cents for the arithmetic mean. A comparison of the geometric means of the weighted and unweighted averages shows that the weighted ruble (about 11 cents) is substantially less than the unweighted ruble (about 18 cents).

The value of the ruble also fluctuates markedly among the separate product categories, indicating a substantial variation in relative prices for electronic commodities produced in the USSR and the US in 1955. This variation may be seen in the comparison of the median values for the product subseries (see Table 2***). Expressed in rubles per dollar and in ascending order of magnitude, these values are as follows: electronic components, 2.4; electronic instruments, 4.0; telephone and telegraph apparatus, 5.6; cathode ray tubes, 6.0; radio and television transmitting equipment, 7.2; receiving-type electron tubes, 9.4; transmitting, industrial, and special-purpose tubes, 9.9; and household radio and television receivers, 11.3.

The variations in the value of the ruble in the aggregate, as well as in the separate product series, illustrate the complexities of deriving a single universally satisfactory average for general-purpose application. For the conversion of ruble measures of output to dollar measures within the nonmilitary sector of electronics, the application of one or several averages may be justified depending on the nature of the data. For over-all costing purposes, however, not differentiated by product subgroupings, two possibilities are presented: a 5.7-to-1 ratio based on the unweighted values and a 9.0-to-1 ratio based on the

* The estimates and conclusions in this research aid represent the best judgment of this Office as of 1 September 1962.

** Ruble values throughout this research aid are expressed in old rubles.

*** P. 4, below.

S-E-C-R-E-T

S-E-C-R-E-T

weighted values.* Of these, the 9.0-to-1 ratio, which represents the geometric mean of the Soviet and US aggregate weighted averages, is considered to be a more realistic indication of the actual value of the ruble in terms of the dollar and is recommended for adoption in nonmilitary costing applications.

This research aid presents 1955 wholesale ruble-dollar price ratios for 168 items produced by the electronics industries of the USSR** and the US. Although the size, composition, and random quality of the sample were controlled by exogenous factors, principally by the availability of Soviet price data, the ratios presented nevertheless are believed to constitute a sufficiently broad and diverse array of electronic price comparisons to be considered representative of nonmilitary electronics production generally. The military sector of electronics production does not have any direct representation in the sample. It is indirectly represented, however, by the inclusion of a significant number of industrial electronics commodities that have dual applicability to both the military and the nonmilitary sectors of production.

All essential data on the ruble-dollar price ratios are given in Tables 1, 2, and 3*** and in the charts, Figures 1 and 2.† In Table 1 is summarized the frequency distribution of the product samples, and in Table 2 are summarized the statistical measures that have been evolved to describe the distribution of the sample as a whole as well as of the separate product subseries. These measures are as follows: the range, the first and third quartiles, the median, and the unweighted mean. The weighted averages derived by the application of Soviet and US weights and the geometric mean of the two are given in Table 3. The distribution of the ratios for the whole sample is presented, in graphic form, in Figure 1, and the distribution of ratios for the separate product subseries is presented in Figure 2.

The ruble-dollar price ratios in the sample vary from a low of 1.0 ruble per dollar for capacitors to a high of 26.8 rubles per dollar for transmitting, industrial, and special-purpose tubes. The median of the distribution is 5.6 rubles per dollar, the geometric mean is 5.7 rubles per dollar, and the arithmetic mean is 7.3 rubles per dollar. Fifty percent of all the items in the distribution fall within a range of from 3.6 to 9.6 rubles per dollar. In general, the distribution may be described as positively skewed and moderately symmetrical over 90 percent of the items but with a high dispersion rate over the terminal 10 percent.

* For further discussion, see VII, p. 15, below.

** The Soviet items were produced by the Ministry of the Radiotechnical Industry and by the Ministry of Communications, USSR.

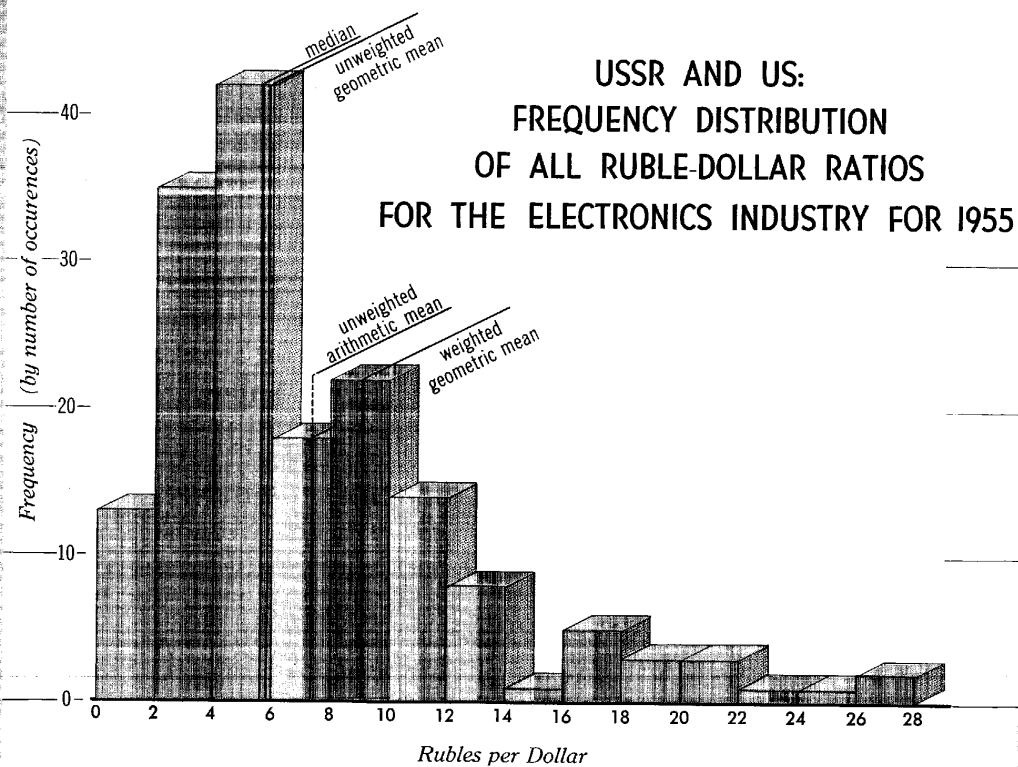
*** Tables 1, 2, and 3 follow on pp. 3, 4, and 5, respectively, below.

† Following p. 2.

S-E-C-R-E-T

SECRET

Figure 1



36551-862

SECRET

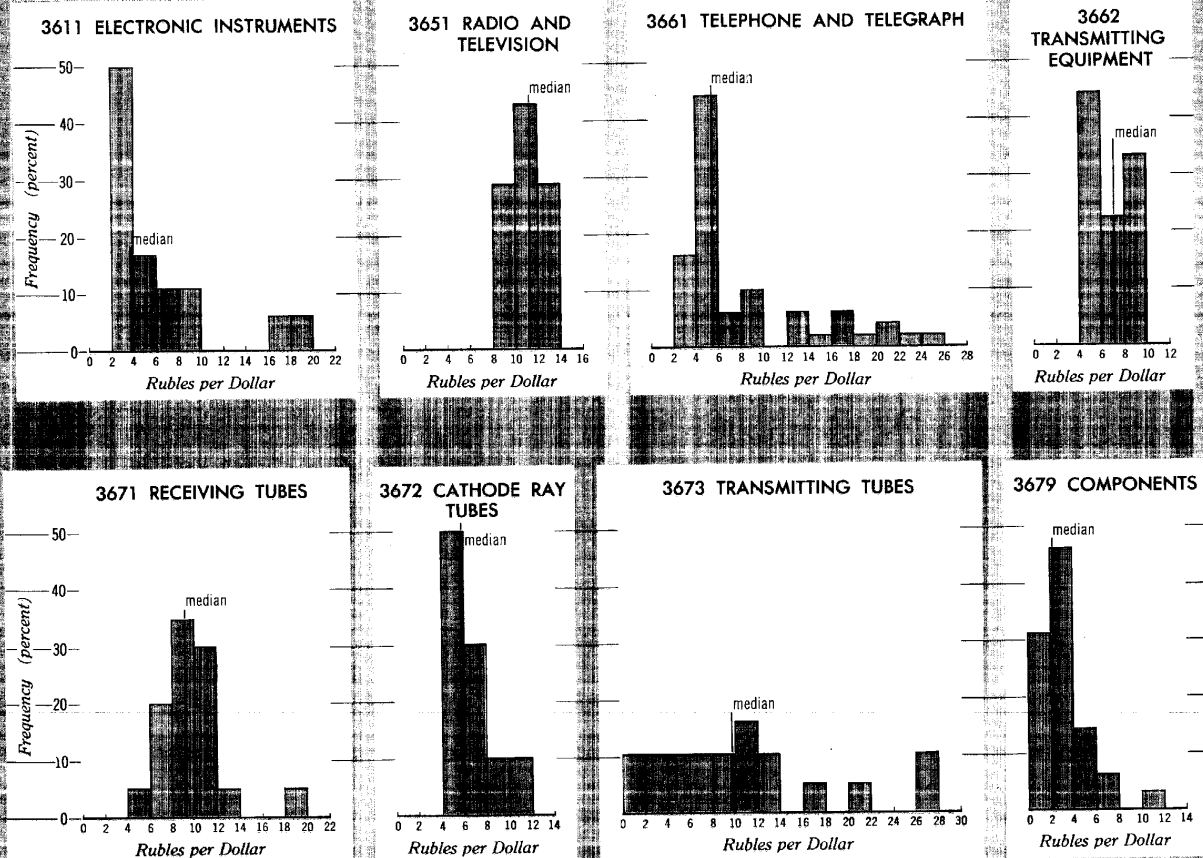
SECRET

USSR AND US

Figure 2

FREQUENCY DISTRIBUTION OF RUBLE-DOLLAR RATIOS FOR THE ELECTRONICS INDUSTRY FOR 1955

BY 4-DIGIT CLASSIFICATION



SECRET

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 1

USSR and US: Frequency Distribution of Ruble-Dollar Price Ratios in the Electronics Industry
by 4-Digit Classification
1955

Distribution of Ratios in Class Intervals of 2 Rubles per Dollar, by Number and by Percent ^{a/}													Total Number of Ratios
Standard Industrial Classification (SIC) Code	Product Category	Unit	0.0 to 1.9	2.0 to 3.9	4.0 to 5.9	6.0 to 7.9	8.0 to 9.9	10.0 to 11.9	12.0 to 13.9	14.0 to 15.9	16.0 to 17.9	18.0 and Above	
	All categories	Number	13	35	42	18	22	14	8	1	5	10 ^{b/}	168
		Percent	7.7	20.8	25.0	10.7	13.1	8.3	4.8	0.6	3.0	6.0	
3611	Electrical measuring instruments and test equipment ^{c/}	Number	0	9	3	2	2	0	0	0	1	1	18
		Percent	0	50.0	16.7	11.1	11.1	0	0	0	5.6	5.6	
3691	Radio and television receiving sets, ex- cept communications types	Number	0	0	0	0	2	3	2	0	0	0	7
		Percent	0	0	0	0	28.6	42.9	28.6	0	0	0	
3661	Telephone and tele- graph apparatus	Number	0	8	22	3	5	0	3	1	3	5	50
		Percent	0	16.0	44.0	6.0	10.0	0	6.0	2.0	6.0	10.0	
3662	Radio and television transmitting, signal- ing, and detection equipment and appa- ratus	Number	0	4	4	2	3	0	0	0	0	0	9
		Percent	0	0	44.4	22.2	33.3	0	0	0	0	0	
3671	Radio and television receiving-type elec- tron tubes, except cathode ray	Number	0	0	1	4	7	6	1	0	0	1	20
		Percent	0	0	5.0	20.0	35.0	30.0	5.0	0	0	5.0	
3672	Cathode ray picture tubes	Number	0	0	5	3	1	1	0	0	0	0	10
		Percent	0	0	50.0	30.0	10.0	10.0	0	0	0	0	
3673	Transmitting, indus- trial, and special- purpose electron tubes	Number	2	2	2	2	2	3	2	0	1	3	19
		Percent	10.5	10.5	10.5	10.5	10.5	15.8	10.5	0	5.3	15.8	
3679	Electronic components and accessories, not elsewhere classified	Number	11	16	5	2	0	1	0	0	0	0	35
		Percent	31.4	45.7	14.3	5.7	0	2.9	0	0	0	0	

a. Percents add horizontally. Because of rounding, components may not add to 100 percent.

b. The class interval 18.0 and above actually extends from 18.0 to 27.9 -- that is, 18.0 to 19.9, 3; 20.0 to 21.9, 3; 22.0 to 23.9, 1; 24.0 to 25.9, 1; and 26.0 to 27.9, 2.

c. Including only electronic items.

- 3 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 2

USSR and US: Statistical Measures of Ruble-Dollar Price Ratios in the Electronics Industry
by 4-Digit Classification
1955

Standard Industrial Classification (SIC) Code	Product Category	Number of Ratios	Lowest	Highest	Range	First Quartile a/	Third Quartile b/	Median	Unweighted Mean	Geometric Mean
	All ratios	168	1.0	26.8	25.8	3.6	9.6	5.6	7.3	5.7
3611	Electrical measuring instruments and test equipment c/	18	2.1	18.0	15.9	2.8	8.3	4.0	6.0	
3651	Radio and television receiving sets, except communications types	7	8.0	12.3	4.3	8.5	12.0	11.3	10.6	
3661	Telephone and telegraph apparatus	50	2.3	25.7	23.4	4.3	10.3	5.6	8.3	
3662	Radio and television transmitting, signaling, and detection equipment and apparatus	9	5.2	9.3	4.1	5.5	8.8	7.2	7.1	
3671	Radio and television receiving-type electron tubes, except cathode ray	20	5.9	19.8	13.7	7.6	10.8	9.4	9.8	
3672	Cathode ray picture tubes	10	4.5	10.0	5.5	4.9	8.0	6.0	6.5	
3673	Transmitting, industrial, and special-purpose electron tubes	19	1.3	26.8	25.5	4.7	13.5	9.9	10.6	
3679	Electronic components and accessories, not elsewhere classified	35	1.0	11.7	10.7	1.9	3.8	2.4	3.0	

- a. The first quartile was derived from the formula $\frac{N+1}{4}$, where N equals the number of observations in each category.
b. The third quartile was derived from the formula $\frac{3(N+1)}{4}$, where N equals the number of observations in each category.
c. Including only electronic items.

- 4 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 3

USSR and US: Aggregate Weighted Averages
for the Nonmilitary Sector of the Electronics Industry
Including Weights and Measures Used in Their Derivation
1955

Aggregate Averages a/ (Rubles per Dollar)				
Using Soviet weights		8.8	Geometric mean	9.0
Using US weights		9.3		

Standard Industrial Classification (SIC) Code	Product Category	Weights and Ratios Used to Derive Aggregate Averages		
		Weights b/		Ratios c/ (Rubles per Dollar)
		USSR	US	
3611	Electrical measuring instruments and test equipment	0.0387	0.0455	6.0
3651	Radio and television receiving sets, except communications types	0.5547	0.4453	10.5 d/ / 11.0 e/
3661	Telephone and telegraph apparatus	0.0925	0.1850	6.0 d/ / 8.3 e/
3662	Radio and television transmitting, signaling, and detection equipment and apparatus	0.0875	0.0916	7.1
3671	Radio and television receiving-type electron tubes, except cathode ray	0.0725	0.0797	9.8
3672	Cathode ray picture tubes	0.0347	0.0776	6.5
3673	Transmitting, industrial, and special-purpose tubes	0.0385	0.0143	10.6
3679	Electronic components and accessories, not elsewhere classified	0.0810	0.0609	7.6 f/
	Total g/	1.000	1.000	

a. Computations are given in Table 6, Appendix A, p. 29, below.

b. Weights are expressed as a fraction of the total and are derived from figures given in Table 5, p. 18, below.

c. Unless otherwise indicated, ratios are unweighted arithmetic means.

d. Internally weighted: subaggregates below the 4-digit level were weighted according to the estimated Soviet pattern of production.

e. Internally weighted: subaggregates below the 4-digit level were weighted according to the estimated US pattern of production.

f. Adjusted mean used with both Soviet and US weights: the pattern of production for this category is similar for both the USSR and the US. The unadjusted mean is equal to 3.0 rubles per dollar.

g. Because of rounding, components may not add to the totals shown.

- 5 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

I. General

This research aid is the culmination of a research project whose primary objective was the collection, consolidation, and analysis of all available price information on commodities produced by the electronics industry of the USSR and on comparable products produced by the electronics industry of the US for the year 1955. The year 1955 was selected because it is the only year for which relatively abundant price information, together with technical data on electronics commodities in the USSR, is available. The majority of price quotations, moreover, are as of the same date, 1 July 1955, and are of the same genre -- that is, wholesale prices of industry.

The price ratios that have been compiled are set forth in this research aid in homogeneous product groupings that are identified by a 4-digit code (the SIC Code) taken from the US Standard Industrial Classification Manual. 1/* This particular coding system was adopted because it provides a simple benchmark for cross-reference purposes; it has been used in a similar intelligence study 2/ and in two unclassified Rand Corporation studies, 3/ and its use will facilitate any desired comparisons of the data in this research aid with that contained in those studies; and it serves as an expedient method for assigning weights to the individual product categories in the computation of the US-weighted mean average and for determining the degree of coverage and representativeness of the sample by permitting the use of the industry statistics contained in the US Census of Manufactures, 4/ which utilizes this system.

The US data used in this research aid are for the year 1954 and are contained in the 1954 edition of the Census of Manufactures as well as in separate issuances of the Bureau of the Census for 1958. For the most part the latter source was used because the aggregation of the data in 1958 provided a more detailed presentation of commodity groupings below the 4-digit level and was, therefore, more usable in analyzing the representativeness of the sample.

The Census of Manufactures includes both military and nonmilitary data. Because this research aid is concerned only with the nonmilitary sector of electronics production, additional information, some of a proprietary nature, was collected from unpublished governmental sources. The resultant collation and analysis of all available data made possible the exclusion of the specifically military portion from the data contained in the Census of Manufactures.

* For serially numbered source references, see Appendix B.

S-E-C-R-E-T

S-E-C-R-E-T

II. Coverage and Representativeness of Sample

An approximate measure of the degree of coverage or representativeness of the sample may be determined for the US by defining a product universe for the electronics manufacturing industry, computing a value for the nonmilitary sector of the industry thus defined, computing similar values for those segments of the industry represented by the sample, and deriving thereby a percentage comparison of the sample to the universe.

In both the USSR and the US the term electronics industry continues to be a generic title applied to a composite of interrelated industries rather than to a homogeneous manufacturing sector with a standard classification of its product mix. Moreover, efforts of classification experts to standardize the product mix are complicated by the continuing rapid proliferation of electronic items by a variety of industries.

In this research aid a workable and reasonably comprehensive definition of the universe of electronics manufacturing was derived by compiling a list of those product categories that are specifically electronic, or contain a significant proportion of electronic commodities, from the Standard Industrial Classification Manual. 5/ These product categories may be seen in Table 4* and are identified by 4-digit designations. The 5-digit level of aggregation in Table 4 represents a further breakdown into more specific groupings and is taken from the Census of Manufactures as described below.

After electronics manufacturing was defined according to major product categories, a measure of the nonmilitary value for these categories for 1954 was ascertained from the value-of-shipments data in the 1958 Census of Manufactures.** The fact that the Census of Manufactures is similarly organized on the basis of the SIC coding system greatly simplified the problem of assigning values to the categories.

Value-of-shipments data were totaled for the 4-digit commodity groupings. This computation yielded an approximate value for the nonmilitary production of the US electronics industry in 1954. Similarly, value-of-shipments data at the 5-digit level were totaled. This level exhibits a much greater heterogeneity in the commodity breakdown than the 4-digit level and makes it possible to assign a value to those specific commodity groupings for which ratios are available. In this

* Table 4 follows on p. 10.

** The majority of SIC product categories are given in Bulletin MC 58 (2)-36D of the Bureau of the Census. 6/ Two categories, computing machines (SIC Code 3571) and electronic instruments (SIC Code 3611), are found in two separate issuances in April 1960, MC(P)-35 E-3 7/ and MC(P)-36 A-6, 8/ respectively.

S-E-C-R-E-T

S-E-C-R-E-T

manner a determination was made of the share of the total electronics output generated by the product classes represented in the sample. These calculations are given in Table 4.

By comparing the total at the 5-digit level (the sample) with the total at the 4-digit level (the universe), it may be concluded that the sample represents approximately 81 percent of the postulated nonmilitary electronics universe for 1954. Relating the sample to the total of all electronics production in the US in 1954, a value of \$5.7 billion, it is seen that the sample represents approximately 50 percent of the total.* Nothing more is claimed for these calculations than that they provide a framework for judging, in a general way, the scope of the sample and its relevance to the purposes for which it has been compiled. The imputation of any greater degree of significance is not intended.

One significant corollary of analysis at the 5-digit level of aggregation is the feasibility of isolating and identifying the important product categories that are not included in the sample. The following types of electronic commodities, by the very nature of the case, are excluded from the tabulation and are not reflected in the sample:

<u>SIC Code</u>	<u>Type of Commodity</u>
36513	Recorders, phonographs, audio amplifiers, tuners, and the like
36623	Intercommunication equipment and electric alarm and signal systems and devices
36624	Electronic navigational aids
36625	Electronic search and detection apparatus, including radar, infrared, and sonar
36626	Electronic industrial and commercial equipment, not elsewhere classified
36791	Solid state semiconductor devices
36793	Resistors for electronic application
36794	Miscellaneous components and accessories
36795	
36790	

The problem of determining the representativeness of the sample in terms of the Soviet electronics industry cannot be satisfactorily**

* The degree to which the individual ruble-dollar ratios are representative of their respective 4-digit and 5-digit commodity groupings has, of course, a critical bearing on the representativeness of the sample. With the possible exception of category SIC Code 3662, for which the ratios are not entirely satisfactory, this consideration does not seriously affect the validity of the methodology employed.

** Text continued on p. 12.

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 4

US: Composition of the Nonmilitary Sector of the Electronics Industry
and Value of Shipments for 4-Digit and 5-Digit Product Categories
1954

Standard Industrial Classification (SIC) Code		Product Category	Total Value of Nonmilitary Shipments Including Interplant Transfers (Million US \$)	
4-Digit	5-Digit		4-Digit	5-Digit
3571		Computing and accounting machines <u>a/</u>	47	
3611		Electrical measuring instruments and test equipment <u>b/</u>	130	130
3651		Radio and television receiving sets, except communications types	1556	
	36511	Household and automobile radios and radiophonograph combinations		364
	36512	Household television receivers, including television combinations		1020
3661		Telephone and telegraph apparatus	529	
	36611	Telephone switching and switchboard equipment		172
	36612	Other telephone and telegraph apparatus, equipment, and components		356
	36610	Telephone and telegraph apparatus, not specified by kind		1
3662		Radio and television transmitting, signaling, and detection equipment and apparatus	282	

a. Representing electronic computing and associated information-processing equipment.

b. Representing that segment of electrical measuring instruments and test equipment that is believed to be electronic.

- 10 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 4
(Continued)

Standard Industrial Classification (SIC) Code		Product Category	Total Value of Nonmilitary Shipments Including Interplant Transfers (Million US \$)	
<u>4-Digit</u>	<u>5-Digit</u>		<u>4-Digit</u>	<u>5-Digit</u>
	36621	Radio and television commercial communications equipment		115
	36622	Radio and television broadcast equipment and closed circuit systems		79
3671		Radio and television receiving-type electron tubes, except cathode ray	228	228
3672		Cathode ray picture tubes	222	222
3673		Transmitting, industrial, and special-purpose electron tubes	41	41
3679		Electronic components and accessories, not elsewhere classified	465	
	36792	Capacitors for electronic applications		121
All categories			<u>3,500</u>	<u>2,849</u>

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

resolved. Although value-of-production estimates for 1954 at the 4-digit level are feasible and have been derived for weighting purposes, more detailed computations for commodity groupings at a 5-digit or other more suitable low level of aggregation are not possible. It may be inferred, however, that the representativeness of the sample as determined for the US is not less applicable to the USSR. In fact, with a relatively smaller nonmilitary sector of electronics production* and less diversity in product mix compared with the US electronics industry in 1954, the sample may be presumed to be even more characteristic of the Soviet electronics industry than of the US.

III. Sources and Methods

The product sample included in this research aid was first taken from the Soviet side and, in particular, from the following publications: (1) a Soviet price handbook on construction materials and equipment, Part II 10/ (hereafter referred to as the Price Handbook, Part II), and (2) a 1958 supplement to the same handbook, Part IV 11/ (hereafter referred to as the Price Handbook, Part IV). The commodities selected, together with their technical specifications and other relevant product descriptions, were then translated into English and combined into homogeneous product groupings. Guidelines and matching criteria were formulated, and the individual product group packages were submitted to appropriate US manufacturers for product comparisons. Respondents were requested to match US products and prices to the Soviet items wherever it was believed a reasonably valid comparison could be made.

Another Soviet handbook containing 1955 prices was similarly exploited -- namely, a price handbook on electrical and electronic test and measuring instruments 12/ (hereafter referred to as the Instruments Handbook). Unfortunately, only four valid comparisons could be made from this source. To augment the sample for electronic instruments, price ratios were constructed from a handbook on dosimetric, radiometric, and electron-physics instruments 13/ (hereafter referred to as the Radiometric Handbook).**

Finally, five Soviet household radio receivers and two Soviet household television receivers were locally available for technical

* The share of military electronics items in the total electronics output has been traditionally greater in the USSR than in the US. 9/

** From a 1959 source (see IX, A, p. 20, below).

S-E-C-R-E-T

S-E-C-R-E-T

inspection and evaluation and were utilized as a source of price information for the consumer electronics sector of the industry.

IV. Prices

The ruble prices presented in this research aid are principally 1955 wholesale prices of industry,* free on board (f.o.b.) depot of shipper -- that is, at the freight depot in the city of manufacture or at the manufacturing site. These prices, which include packing but are net of wood or special crating and exclude outbound transportation charges and other storage and marketing surcharges, are uniform for the USSR. ^{15/} Turnover taxes, although conceptually included in the price, have been effectively eliminated from manufactured producers' goods since 1949 and are not believed to have been a significant factor in the composition of 1955 wholesale prices for electronic commodities. ^{16/} Essentially, these prices are believed to be generally related to the average cost within the electronics industry, with an allowance for profit. ^{17/}

The sample that is presented in this research aid, however, is not based exclusively on 1 July 1955 ruble prices. Exceptions have been made for the consumer sector and for the instruments subsector** of the electronics industry. In the case of the consumer sector (the product category of household radio and television receivers), the total absence of wholesale price data dictated the admission of some 1955 nonwholesale prices into the sample -- that is, the price ratios are based on a retail price comparison.***

Ruble retail prices were taken from the Soviet press for five radio receivers and two television receivers that were locally available for inspection. These receivers were submitted to US manufacturers; the dollar retail prices are based on their technical evaluation of the equipment and are the manufacturers' estimated US retail prices for these same items if produced in the US.

* That is, optovaya tsena promyshlennosti. This price differs conceptually from the wholesale price of enterprises (optovaya tsena predpriyatiya), which is the price that the producing enterprise receives for its product and which is exclusive of turnover tax. ^{14/} In effect, these prices are the same for the commodities priced in this research aid.

** The electronics industry of the USSR is normally considered to comprise military, industrial, and consumer sectors. Electronic instruments manufacture is included as a subsector of the industrial sector.

*** See IX, B, p. 21, below.

S-E-C-R-E-T

S-E-C-R-E-T

In the case of electronic instruments, wholesale prices (unidentified as to date) from a 1959 source were used, with the exception of four items extracted from the Instruments Handbook.* Although the ruble price quotations for these items are not defined, it was assumed that these quotations have the same inclusions and exclusions as other items in the sample.

With respect to the US side of the sample, wholesale prices are generally similar to Soviet prices. US manufacturers have provided 1955 prices and mid-1955 prices where possible. Quotations are f.o.b. factory, including manufacturer's profit, but net of wood or special packing. Insofar as possible, dollar prices, per unit of equipment, are those paid by an average large-lot buyer excluding price premiums for small orders and extreme discounts for unusually large orders.

V. Matching Criteria

Ideally, ruble-dollar price ratios should be based on exact matching of Soviet and US commodities, but such an exact matching is attainable only in the case of Soviet items that have been copied and reproduced from US items.** In this sample the Soviet technical descriptions and specifications of the commodities are generally not sufficiently detailed to admit of precise comparisons. Accordingly, when matching on the basis of virtual identity in physical and functional characteristics was of necessity impossible, matching has been accomplished on the basis of a fundamental similarity in physical or functional characteristics. In some cases, matching was complicated by design obsolescence -- that is, Soviet equipment reflected obsolete design by US standards of 1955, necessitating a match with US equipment of an earlier year. Dollar prices as of 1955 on these items were necessarily approximations by the respondent.

* A larger selection of items from this handbook was effectively precluded by the exceptional difficulties encountered by the US respondent in product comparisons of electronic instruments owing to the differences between the US and Soviet state-of-the-art -- that is, most of the instruments for which 1955 ruble prices are available were manufactured in the US during and/or shortly after World War II. US respondents were understandably reluctant to formulate comparisons involving such an extensive timelag.

** Even in these cases, there is no assurance of comparability in the quality of materials entering into the manufacture of an item, in the performance of the item under diverse operating conditions, or in the reliability of the item.

S-E-C-R-E-T

S-E-C-R-E-T

VI. Frequency Distribution

A graphic description of the frequency distribution of all ruble-dollar ratios for the electronics industry of the USSR and the US in 1955 is presented in Figure 1,* based on a class interval of 2.0 rubles per dollar. This class interval was selected because, in the majority of cases and especially for the distribution as a whole, it more readily defined the area of central tendency than the alternate intervals that were considered. A notable exception is the category of transmitting, industrial, and special-purpose tubes, which shows a fairly even dispersion of values throughout its distribution (see Figure 2*). Empirical analysis indicates that in this case the values tend to cluster in the area of 2.5 to 5.0 rubles per dollar in a range of values extending from 1.3 to 26.8 rubles per dollar.

As indicated by Figure 1, the distribution is relatively normal for most of the items, with an unmistakable tendency of the values to cluster about a central point. Half of the items fall within a range of from 3.6 to 9.6 rubles per dollar. Relatively high ruble-dollar ratios (above the class interval 12.0 to 13.9) are few in number, constituting less than 10 percent of the total distribution.

VII. Selection of a Representative Measure

The selection of a single ratio sufficiently representative of all the values in the distribution to be used instead of those values for ruble-dollar conversion purposes is the central focus of this research aid. Essentially, the selection problem is reduced to two statistical choices -- the unweighted geometric mean average and the weighted geometric mean average.

A. Unweighted Average

The most representative ratio for the unweighted distribution is that statistical average which most accurately measures the point of central tendency of all the values. In this distribution, that average is determined to be the geometric mean which yields a ruble-dollar ratio of about 6 to 1. Other measures, although possible, are considered to be somewhat less desirable. For example, the arithmetic mean is less desirable because of the disproportionate influence exerted in this distribution by the atypical values at the upper end of the curve. The median, although less affected by the size of the extreme items, is sensitive to their number and, in view of the disparity in the number of observations among the several product categories, is also theoretically less desirable. Practically, however, there is

* Following p. 2, above.

S-E-C-R-E-T

S-E-C-R-E-T

only a slight difference between the geometric mean and the median of this distribution. An alternative determination of the point of maximum concentration of the values may be made by excluding the atypical values and calculating the arithmetic mean for the more "normal" portion of the frequency curve. Thus, if the distribution is truncated after the class interval 12.0 to 13.9 rubles per dollar, thereby excluding the extreme items in the upper 10 percent of the curve, this adjusted distribution yields an arithmetic mean value of 6.0 rubles per dollar, which coincides with the geometric mean, rounded, of the original distribution. Approximately 6.0 rubles per dollar, therefore, appears to be the most accurate indicator of the actual value of the ruble in terms of the dollar that is realizable from the unweighted values.

B. Weighted Average

Soviet-value weights and US-value weights were determined for each of the eight product categories (4-digit level) of electronic equipment. These weights are shown in Table 5.* Soviet weights are estimates of value of production, and US weights are taken from the Census of Manufactures. Although these weights are applied to 1955 ruble-dollar ratios, they are derived from 1954 data.

Two aggregate ratios were derived from these weights according to the following formulas:

$$R_{us} = \begin{array}{l} \text{Ruble-dollar ratio} \\ \text{weighted by US-} \\ \text{value weights} \end{array} = \frac{\begin{array}{l} \text{Sum of ruble-dollar ratios for each} \\ \text{product category times the US-} \\ \text{value weights} \end{array}}{\text{Sum of US-value weights}}$$

$$R_{ussr} = \begin{array}{l} \text{Ruble-dollar ratio} \\ \text{weighted by Soviet-} \\ \text{value weights} \end{array} = \frac{\begin{array}{l} \text{Sum of Soviet-value weights} \\ \text{Sum of dollar-ruble ratios for each} \\ \text{product category times the Soviet-} \\ \text{value weights} \end{array}}$$

The actual computations resulting from the applications of these formulas are given in Table 6.** The arithmetic mean ratio weighted by US weights (R_{us}) is equal to 9.3 rubles per dollar; the arithmetic mean weighted by Soviet weights (R_{ussr}) is equal to 8.8 rubles per dollar.

* Table 5 follows on p. 18.

** Appendix A, p. 29, below.

S-E-C-R-E-T

S-E-C-R-E-T

The geometric mean of the two aggregate averages is equal to 9.0 rubles per dollar.*

The weighted means show only a slight difference, whether using US or Soviet weights, probably because weighting was done at a relatively high level of aggregation. If data were available for more detailed weighting, the dissimilarities between the relatively highly diversified product mix of the US electronics industry and the relatively narrow product mix of the USSR (in 1955) probably would be reflected in a much wider gap in the two arithmetic means. The difference, in other words, between weighted means results from the application of the output structure of one economy to the price structure of the other. In the free market economy of the US those commodities of the electronics industry that are produced in greater relative quantities tend to have lower relative prices. In the USSR this same tendency is believed to exist even though the Soviet price-output structure is somewhat less reflective of scarcity relations and demand conditions because of the continuing subordination of electronics production to the politicomilitary requirements of the state. It frequently happens, therefore, that relatively low US prices are associated with relatively small quantities of output in the USSR and that, similarly, relatively high US prices are frequently associated with relatively large output in the USSR.

* The mathematical expression of these weighting formulas is as follows:

$$R_{us} = \frac{\sum_{i=1}^n \frac{P_{ussr_i}}{P_{us_i}} (V_{us_i})}{\sum_{i=1}^n V_{us_i}} \quad R_{ussr} = \frac{\sum_{i=1}^n V_{ussr_i}}{\sum_{i=1}^n \frac{P_{us_i}}{P_{ussr_i}} (V_{ussr_i})}$$

R_{us} = ruble-dollar ratio weighted by US-value weights
 R_{ussr} = ruble-dollar ratio weighted by Soviet-value weights
 P_{us} = price of commodity in dollars
 P_{ussr} = price of commodity in rubles
 V_{us} = US-value weights
 V_{ussr} = Soviet-value weights

Σ = sum
 n = number of product categories
 i = 1, 2, 3 ... (each value of i refers to a specific product category)

S-E-C-R-E-T

S-E-C-R-E-T

Table 5

USSR and US: Value Weights for Product Categories
of Equipment in the Electronics Industry
by 4-Digit Classification
1954

Standard Industrial Classification (SIC) Code	USSR	US
	Estimated Value of Nonmilitary Production (Million Rubles)	Value of Nonmilitary Shipments ^{a/} (Million US \$)
3611	155 ^{b/}	130
3651	2,220 ^{c/}	1,273
3661	370 ^{d/}	529
3662	350 ^{e/}	262
3671	290 ^{f/}	228
3672	139 ^{f/}	222
3673	154 ^{f/}	41
3679	324 ^{g/}	174
Total	<u>4,002</u>	<u>2,859</u>

a. US weights are based on value-of-shipments data at the 4-digit level of aggregation, excluding, insofar as possible, the US value for those items that were not calculated into the Soviet estimated weights. The exclusions were made to achieve consistency and comparability in weighting. For this reason the US weights do not equate to the corresponding 4-digit values for nonmilitary shipments given in Table 4, p. 10, above. The figures presented were derived from 1954 Bureau of the Census data. For proprietary reasons, details of their derivation are not presented.

b. Derived from the application of a published figure for the growth of production of electronic instruments during 1950-60 ^{18/} to a 1958 base-year estimate.

c. Based on a published study of the Soviet electronics industry. ^{19/}

d. Based on the amount of telephone and telegraph apparatus, telephone and telegraph exchanges, and terminal and relay multiplexing equipment and associated amplifying equipment installed in the USSR during 1954. ^{20/} Production was equated to installation. Value was estimated by applying appropriate price quotations from the Price Handbook, Part II, to the increments of installed equipment.

e. Derived by applying prices from the Price Handbook, Part II, to production estimates of point-to-point transmitters, radiobroadcasting transmitters, television transmitting stations, and wire radio-diffusion equipment. ^{21/} Production was equated to the amounts installed.

f. Taken from a published study on the Soviet electron tube industry. ^{22/}

g. Based on official Soviet data. ^{23/}

S-E-C-R-E-T

S-E-C-R-E-T

The foregoing discussion is intended to highlight the significance of the weighted arithmetic procedure, which may be presumed, other things being equal, to be the most effective technique for deriving a representative measure to express the relationship between the ruble and the dollar for the electronics industry as a whole. The geometric mean of the Soviet and US weighted averages (9.0 rubles per dollar), therefore, is considered to be more desirable as an over-all index than the geometric mean of the unweighted values (5.7 rubles per dollar) and is recommended for use in costing applications within the nonmilitary sector of the electronics industry of the USSR at high levels of aggregation. At lower levels of aggregation -- as, for example, when the data being costed relate to a specific product series -- the median value of the series may be more applicable.

VIII. Military Measure

The measures discussed above, although derived from nonmilitary data, may be used, in the absence of a more appropriate substitute, in a military electronics context as well. This is true because (1) some commodities, such as telephone and telegraph apparatus and test instruments, are, with minor modifications, used for military as well as nonmilitary purposes and because (2) components such as electron tubes and capacitors enter into the composition of both military and nonmilitary end items. Assuming, as the evidence suggests, that military procurement also is carried out on the basis of the wholesale prices of industry, the ruble-dollar ratios in the above cases would not be significantly different in a military context.

It is suggested that, for military costing purposes, the unweighted geometric mean average would be preferable to its weighted counterpart because a representative ruble-dollar ratio for the military sector probably would be significantly lower than that developed for the nonmilitary sector. This assumption is partly explained by the overriding emphasis that is placed on military electronics in the USSR and on what may be presumed as a corollary, a greater degree of efficiency both in terms of the equipment used and in the organization of production. A greater relative output of most military items also implies a lesser cost per unit of output. These factors are not present to the same degree in the US.

Assuming that a purely military sector measure would be lower than its nonmilitary counterpart, it is suggested that a composite (military and nonmilitary) Soviet weighted average for the electronics industry as a whole would be substantially less than the 9.0-to-1 ratio derived for the nonmilitary sector and probably would approach the 5.7-to-1 ratio already discussed. The major reasons for this are twofold: (1) an exceptionally high weight would be applied to the military

S-E-C-R-E-T

S-E-C-R-E-T

index, imparting a downward bias, and (2) the impact of the relatively high ruble-dollar weight for entertainment radio and television sets, which has imparted such a strong upward bias to the nonmilitary sector weighted average already derived, would be greatly reduced.

IX. Product Categories: General Comments

A. Electronic Instruments (SIC Code 3611)

In Table 7* are listed 18 ruble-dollar price ratios. The sampling is restricted to 2 signal generators, 2 Q-meter comparisons, and 14 assorted types of dosimetric and radiometric equipment produced for limited consumption. The sample, therefore, cannot be considered a fully satisfactory representation of electronic instrument production.

The dollar wholesale prices are 1955 catalog prices per unit f.o.b. factory. These prices are not necessarily those of an "average lot buyer," because most instrument wholesale prices in the US are subject to negotiation between manufacturers and buyers and are sensitive to the exigencies of the competitive situation.

Ruble prices for signal generators and Q-meters are as of 1 July 1955. In the case of dosimetric and radiometric equipment, wholesale prices are taken from a 1959 handbook and are assumed to have the same inclusions and exclusions as other items in the sample. The effective date of these prices is not stated. There is a strong presumption in favor of the belief that they are 1955 quotations because the wholesale prices authorized on 1 July 1955 for Soviet producers' goods were instituted for the period of the Sixth Five Year Plan (1956-60), and although this plan has since been abandoned, it appears that 1955 prices are still in effect for most of the commodities of the Seven Year Plan (1959-65). Any price quotations that may be post-1955 probably are somewhat lower.**

With respect to the US prices on products matched to those in the 1959 handbook, quotations are for 1959. The wholesale price trends for instrument end items of the electronics industry in the US are not

* Appendix A, p. 31, below.

** The price trend on electronic end items, where comparisons are possible, appears to be downward. On the other hand, some wholesale price increases have been noted for components. Comparison of 1955 and 1956 prices for a few capacitors shows a moderate increase in the 1956 wholesale price. The increases, however, apply to high-frequency mica capacitors that are produced in relatively small quantities. Such increases are believed to be atypical.

S-E-C-R-E-T

S-E-C-R-E-T

easily ascertained but do not appear to be significantly different from those of 1955. Whatever economies have been achieved by using components, the wholesale price of which has been declining, are largely compensated for by frequent design changes and the fact that the instruments in question are produced in relatively small quantities for a limited market. To the extent that 1959 Soviet prices may have declined to a greater degree than the corresponding 1959 US prices relative to 1955, the ruble prices for electronic instruments are understated, and the resultant ratios are too low.

The signal generators and Q-meters in the sample are relatively unsophisticated equipment judged by US standards of 1955 and resemble equipment produced in the US during or shortly after World War II. They suggest that the manufacture of Soviet electronic instruments in 1955 was substantially inferior to corresponding manufacture of instruments in the US. An unpublished comparison of Soviet and US oscilloscopes, which indicates that Soviet oscilloscopes possess lesser capabilities than US counterparts and are usually larger, heavier, and more crudely designed, provides corroborative evidence of this inferiority.

A large proportion of the dosimetric and radiometric equipment described in the Radiometric Handbook appears to have been designed for military usage. To the extent that these instruments incorporate engineering safety margins (designs, materials, and ratings) more commonly associated with the manufacture of military instruments, the comparisons with less costly commercial-type US equipment prices in this sample are inaccurate, and the intrinsic bias is not reflected in the ratios.

B. Radio and Television Receiving Sets (SIC Code 3651)

Retail prices for household radios and television receivers were admitted into the sample for the following reasons: first, no wholesale price data on Soviet consumer electronic items are available; second, the omission of consumer price comparisons would exclude from consideration an important sector of electronics production and would seriously affect the representativeness of any nonmilitary sector ratio derived in its absence; and, third, it was assumed that no significant distortion or bias would be introduced by way of the inclusion of these items. The determination of bias in the use of retail prices, instead of wholesale prices, is related to the amount of retail markup (that is, tax and profits to intermediaries) contained in the retail prices of Soviet and US consumer electronic items. The problem of ascertaining the markup in the USSR is made difficult by the absence of direct information on the components of final cost, including turnover tax. From the information available the markup above the f.o.b. factory price in the USSR appears to be of the same general order of magnitude as in the US.*

* Although this statement appears to be generally true, it should be noted that radio and television receivers [footnote continued on p. 22]

S-E-C-R-E-T

S-E-C-R-E-T

Table 8 contains seven ruble-dollar price ratios for two household television receivers and five household radio receivers. The US dollar prices are retail prices prevailing in the US in August 1955. The ruble prices for the television receivers are December 1955 quotations. The ruble prices for the radio receivers are as of the following dates: "Mir," March 1955; "Rekord," July 1955; "Moskvich," August 1955; "Riga-6," October 1955; and "ARZ," March 1956.

The selection of appropriate ruble prices for the television receiving sets poses a special problem because substantial reductions in the retail prices of these items on two occasions in 1955 raise critical questions as to the acceptability of any single price for comparison purposes. The retail price changes occurred in July and December 1955 and resulted in rather sharp reductions. The July reduction appears to have ranged between 500 and 700 rubles per receiver and the December 1955 reduction from 300 to 500 rubles per receiver. The more expensive sets appear to have received the greatest reductions. If it is assumed that price reductions are, at least in part, a reflection of Soviet planning efforts to bring supply and demand conditions into more realistic accord, then the December 1955 retail prices probably are more representative of market conditions obtaining in July 1955 and therefore are more truly comparable to US prices in mid-1955 than the actual July prices in the USSR. For this reason, the December 1955 prices were selected for the Soviet side of the television receiver sample. That the December prices also must be treated with caution is emphasized by the introduction of yet another retail price reduction on television receivers in August 1956.

The quality of Soviet radio receivers in terms of mechanical workmanship, electronic design, and component performance varies from set to set but, generally speaking, is not substantially different from comparable US models. Technical evaluation of the "Mir" receiver, for example, indicates the following: wiring methods conform to those in the US; radiofrequency oscillator coils and intermediate frequency transformers are of conventional design and possess good insulating characteristics against moisture and fungus growth; solder is of good quality; and solder connections are well formed. This set, which is an export model, is in most respects comparable to 1955 US export models. On the other hand, receivers intended exclusively for domestic consumption are of lesser quality and are somewhat less comparable to US counterparts.

are important information media which serve priority propaganda objectives of the Soviet government. In some cases, therefore, retail prices may be set without reference to f.o.b. factory price (even below actual cost of production when production of an item is expanding rapidly ^{24/}) in order to clear the market and provide for widespread availability. The ratios presented in Table 8 (Appendix A, p. 37, below) are not believed to be affected by such a pricing anomaly.

- 22 -

S-E-C-R-E-T

S-E-C-R-E-T

The "Moskvich," for example, has many components of cheap quality and of low reliability, selectivity, and sensitivity characteristics, and its over-all performance is below that of similar US models.

Soviet television receivers also compare favorably with US counterparts in mechanical workmanship and electrical design characteristics. There are many indications in the Soviet press, however, that in terms of service life, reliability, and general operating performance Soviet television receivers are less comparable to US counterparts.

C. Telephone and Telegraph Apparatus (SIC Code 3661)

A total of 50 ruble-dollar price ratios that cover virtually the whole gamut of telephone and telegraph production is given in Table 9.* There are, for example, 10 price ratios for telephones, including table-type, wall-type, pay-booth, and specialized mine-type telephones; 9 ratios for manual telephone exchanges extending from 100-number to 600-number capacity, including distributing frames and test devices; 9 automatic telephone exchanges extending from 100-number to 900-number capacity; 3 ratios for lower capacity, step-system automatic telephone exchanges for installation primarily in rural areas; 4 ratios for 1-channel and 3-channel terminal and intermediate-type multiplexing apparatus; 4 ratios for ancillary equipment; and 6 ratios for telegraph apparatus.

The one ratio that may be misleading is that of the T-50 start-stop transmitter, which reportedly was not in production in 1955. To the extent that this price may have been subsequently reduced under conditions of series production, this ratio may be too high.

D. Radio and Television Communication Equipment (SIC Code 3662)

A total of nine ruble-dollar price ratios is given in Table 10,** including a single ratio for a standard very-high-frequency (VHF) television transmitter, two ratios for the "Blesna"-type radio transmitter, and six ratios for terminal and intermediate "Strela"-type microwave radio relay equipment.

Ruble prices for the television transmitter and the "Blesna"-type radio equipment are quotations for 1 July 1956. Ruble prices for the "Strela" microwave equipment are quotations for 1 January 1957.*** Dollar prices are for mid-1955.

* Appendix A, p. 38, below.

** Appendix A, p. 44, below.

*** A 1 July 1955 price for the receiver-transmitter intermediate "Strela M" station is available in the Price Handbook, Part II. It is doubtful that this price, quoted at [footnote continued on p. 24]

S-E-C-R-E-T

S-E-C-R-E-T

The category comprises a variety of radio transmitting equipment, including point-to-point transmitters, radiobroadcast transmitters, and wire radio-diffusion equipment. The limited number of ratios presented raises serious questions of the representativeness of the sample. Conspicuously absent, for example, is any ratio for the Soviet "Urozhaï"-type radio transceiver, which is extensively employed in rural areas and is widely installed aboard trawlers and smaller marine craft. This deficiency is only partly rectified by the inclusion in the sample of ratios for "Blesna"-type equipment, which appears to have its principal application to shipboard use on larger maritime vessels.

E. Electron Tubes: Receiving Type (SIC Code 3671); Cathode Ray Type (SIC Code 3672); and Transmitting, Industrial, and Special-Purpose Type (SIC Code 3673)

Receiving Type: a representative sampling of receiving-type electron tubes produced in the USSR is given in Table 11,* including two price ratios for diodes, three ratios for triodes, one ratio for double triodes, five ratios for radiofrequency pentodes, six ratios for power output pentodes and beam power tetrodes, two ratios for heptodes, and a single ratio for diode-pentodes.

Cathode Ray Type: a total of 10 ruble dollar price ratios is given in Table 12,** including 6 ratios for cathode ray tubes designed for oscillograph application, 3 ratios for cathode ray tubes used in television receivers, and 1 ratio for a television-transmitter cathode ray tube.

Transmitting, Industrial, and Special-Purpose Type: a total of 19 ruble-dollar price ratios is given in Table 13,*** including 2 ratios for transmitting triodes, 3 ratios for transmitting tetrodes and pentodes, 1 ratio for magnetrons, 3 ratios for special-purpose tubes, 1 ratio each for kenotrons and thyratrons, 3 ratios for regulators, and 5 ratios for photo and photomultiplier tubes.

The Soviet tube industry is not so broadly based or so diversified in product mix as the US tube industry, and the samples presented

51,000 rubles, is a realistic one, for the "Strela" equipment was first produced in 1955 and only in token numbers. In 1955 it was produced at an experimental plant of a scientific research institute of the Ministry of Communications and was later turned over to one of the plants of the Ministry of the Radiotechnical Industry for series production. 25/

* Appendix A, p. 47, below.

** Appendix A, p. 50, below.

*** Appendix A, p. 51, below.

S-E-C-R-E-T

S-E-C-R-E-T

are believed to be adequately representative of the relatively more restricted tube inventory of the USSR.

In terms of comparability, Soviet tubes are generally comparable to US counterparts in electrical and mechanical performance characteristics. Soviet tubes that have been available for US laboratory analysis, principally receiver-type tubes, revealed no major differences in construction from US tubes manufactured at the same time. Subjected to swept-frequency resonancy tests and vibration and shock tests, Soviet tubes generally pass US Army MIL-E-1 specifications with ease. The comparability of Soviet and US tubes is partly explained by the fact that Soviet tubes are patterned in large measure after US and Western prototypes. US tubemaking equipment, such as seallexes, grid lathes, and lockseam cathode machines, has been reproduced by the USSR and improved. In addition, Soviet tube technology has been successfully advanced by virtue of an intensive exploitation of US publications and know-how. Other factors that tend to insure an effective tube industry are the subordination of tube production to the user's needs, thereby eliminating the inefficiency indigenous to an industry which arbitrates its own goals, and the utilization of competent engineering talent in adequate numbers.

The ratios for tubes are relatively high, implying a higher cost tube industry in the USSR than in the US. This situation would reasonably be expected in view of the fact that Soviet tubes appear to be designed for both military and nonmilitary end usage. A large engineering effort appears to be directed toward constant improvement in electromechanical design. Soviet mechanical designs are of the highest quality, apparently accomplished without stringent cost restrictions; in the US, on the other hand, electron tube design represents a compromise between competitive pricing and the preservation of quality standards. Soviet tubes, moreover, employ the highest quality of materials, shunning substitutes that would reduce costs. Finally, Soviet tubes appear to be produced with a greater labor input and higher level of handwork.

F. Electronic Components (SIC Code 3679)*

A total of 35 ruble-dollar ratios for electronic capacitors is given in Table 14.** The other major constituent of electronic components, resistors, is not represented in the sample.

As a general appraisal, based on a technical evaluation in US laboratories, Soviet capacitors and resistors are inferior to their US

* Ruble prices in this section are for 1 July 1956, and dollar prices are for 1 July 1955.

** Appendix A, p. 54, below.

S-E-C-R-E-T

S-E-C-R-E-T

counterparts. An examination of aluminum electrolytic capacitors, for example, showed poor electrical performance and inferior shelf characteristics in the entire voltage range. Foil quality was comparable to cheap foil used in the US, and uneconomical, narrow-width etching suggests an unsophisticated technology. An examination of film capacitors indicated a tendency toward greater size than in the US and the use of greater dielectric thicknesses. Although, under electrical examination, all fell within the specified capacitance tolerances of US standards, engineering was generally poor. The workmanship of film capacitors using polystyrene dielectric was acceptable, whereas that of those using teflon dielectric was not. In terms of capacitance change with temperature dissipation factor, insulation resistance, and life test characteristics, Soviet capacitors were inferior to those produced in the US -- that is, US units have a lower temperature coefficient and higher insulation resistance. In addition, the use of considerable hand labor organized in the framework of a relatively crude production technology was implied. Paper capacitors, in like manner, indicate that the USSR emphasizes economical and unsophisticated construction practices and that the capacitors are produced under conditions of mass production by unskilled labor.

A technical evaluation of Soviet deposited-carbon resistors reflects the same standards of poor quality and indicates that the state-of-the-art in resistor production is comparable to that achieved in Western Europe shortly after World War II.

Because the sample of capacitors and resistors that was subjected to technical analysis was not large, it cannot be assumed that it reflects over-all Soviet capabilities in components manufacture -- in fact, for specialized military applications it may reasonably be assumed that Soviet components embody a much more advanced state-of-the-art.

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX A

STATISTICAL TABLES

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8
S-E-C-R-E-T

Table 6

USSR and US: Application of Weighting Formulas in Computation
of Aggregate Weighted Averages in the Electronics Industry
1955

USSR						
$\text{Formula } R_{\text{USSR}} = \frac{\sum_{i=1}^n \frac{P_{\text{USSR}_i}}{P_{\text{USSR}_i}} (V_{\text{USSR}_i})}{\sum_{i=1}^n \frac{P_{\text{USSR}_i}}{P_{\text{USSR}_i}}} = 8.8$						
		(1)	(2)	(3)	(4)	(5)
		$\frac{P_{\text{US}}}{P_{\text{USSR}}}$	V_{USSR}	$V_{\text{USSR}} \text{ a/}$	$\frac{P_{\text{US}}}{P_{\text{USSR}}} (V_{\text{USSR}})$	R_{USSR} (See Formula Above)
Standard Industrial Classification (SIC) Code	Product Category	Arithmetic Mean (Dollar-Ruble) Ratio b/ g/	Value of Production in the USSR (Million Rubles)	Column (2) Expressed as a Fraction of the Total	Column (1) x Column (3)	Sum of Column (3) Divided by Sum of Column (4)
3611	Electrical measuring instruments and test equipment	1/6.0	155	0.0387	0.0064	
3651	Radio and television receiving sets, except communications types	1/10.5 d/	2,220	0.5547	0.0528	
3661	Telephone and telegraph apparatus	1/6.0 d/	370	0.0925	0.0154	
3662	Radio and television transmitting, signaling, and detection equipment and apparatus	1/7.1	350	0.0875	0.0123	
3671	Radio and television receiving-type electron tubes, except cathode ray	1/9.8	290	0.0725	0.0074	
3672	Cathode ray picture tubes	1/6.5	139	0.0347	0.0053	
3673	Transmitting, industrial, and special-purpose electron tubes	1/10.6	154	0.0385	0.0036	
3679	Electronic components and accessories, not elsewhere classified	1/7.6 e/	324	0.0810	0.0107	
Total f/			4,002	1.0000	0.1132	$\frac{1}{0.1132} = 8.8$
US						
$\text{Formula } R_{\text{US}} = \frac{\sum_{i=1}^n \frac{P_{\text{USSR}_i}}{P_{\text{US}_i}} (V_{\text{US}_i})}{\sum_{i=1}^n \frac{P_{\text{USSR}_i}}{P_{\text{US}_i}}} = 9.3$						
		(1)	(2)	(3)	(4)	(5)
		$\frac{P_{\text{USSR}}}{P_{\text{US}}}$	V_{US}	$V_{\text{US}} \text{ a/}$	$\frac{P_{\text{USSR}}}{P_{\text{US}}} (V_{\text{US}})$	R_{US} (See Formula Above)
Standard Industrial Classification (SIC) Code	Product Category	Arithmetic Mean (Ruble-Dollar) Ratio c/	Value of Production in the US (Million US \$)	Column (2) Expressed as a Fraction of the Total	Column (1) x Column (3)	Sum of Column (4) Divided by Sum of Column (3)
3611	Electrical measuring instruments and test equipment	6.0	130	0.0455	0.2730	
3651	Radio and television receiving sets, except communications types	11.0 g/	1,273	0.4453	4.8983	
3661	Telephone and telegraph apparatus	8.3 g/	529	0.1850	1.5355	
3662	Radio and television transmitting, signaling, and detection equipment and apparatus	7.1	262	0.0916	0.6504	
3671	Radio and television receiving-type electron tubes, except cathode ray	9.8	228	0.0797	0.7811	
3672	Cathode ray picture tubes	6.5	222	0.0776	0.5044	
3673	Transmitting, industrial, and special-purpose electron tubes	10.6	41	0.0143	0.1516	
3679	Electronic components and accessories, not elsewhere classified	7.6 g/	174	0.0609	0.4628	
Total f/			2,859	1.0000	2.2571	$\frac{2.2571}{1} = 9.3$

- a. Figures for individual product categories were derived as a percentage of the total value figure (column (2)) and converted to decimal form.
b. The inverted ratios in column (1) are dictated by the formula R_{USSR} , which requires the use of dollar-ruble ratios.
c. Unless otherwise indicated, ratios are unweighted means.
d. Internally weighted: subaggregates below the 4-digit level were weighted according to the estimated Soviet pattern of production.
e. Adjusted mean used with both Soviet and US weights: the pattern of production for this category is similar for both the USSR and the US. The unadjusted mean is equal to 3.0 rubles per dollar.
f. Because of rounding, components may not add to the totals shown.
g. Internally weighted: subaggregates below the 4-digit level were weighted according to the estimated US pattern of production.

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 7

USSR and US: Electronic Instruments (SIC Code 3611) -- Specifications, Prices, and Ruble-Dollar Ratios
1955

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
Apparatus for individual dosimetric control	<u>KID-1</u>	<u>K-7255</u> : Pocket chamber with K-4255 charger-reader	3,500 a/*	445 a/	7.9
	Measurement range (roentgens): 0.02 to 2.0 Fundamental error in readings (roentgens): 1st subband, not greater than ± 0.02 2d subband, not greater than ± 0.3 Dimensions: Chamber: length 120 millimeters (mm), diameter 15 mm Charger-reader: 335 x 225 x 200 mm	0 to 0.2 -0.012 Length 90 mm, diameter 13 mm 125 x 175 x 75 mm			
	<u>DK-O.2</u>	<u>L50 Dosimeter</u> with L24K charger	350 b/	85 b/	4.1
	Measurement range: 0 to 200 roentgens Fundamental error in readings: ± 10 percent Dimensions: Dosimeter: length 115 mm, diameter 15 mm Charger: 128 x 128 x 115 mm	± 5 percent Length 100 mm, diameter 13 mm 150 x 200 x 75 mm			
Apparatus for measuring the size of gamma radiation doses	<u>PMR-1</u> : Portable microroentgenometer	<u>2586</u>	1,800	355	5.1
	Detection unit: ionization chamber Measurement range: 0 to 5,000 microroentgens per second Fundamental error in readings: ± 10 percent Dimensions: 220 x 130 x 170 mm Weight: 3.5 kilograms (kg)	2.5 kg			

* Footnotes for Table 7 follow on p. 36.

- 31 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 7

USSR and US: Electronic Instruments (SIC Code 3611) -- Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
Apparatus for measuring the size of gamma radiation doses (Continued)	<u>KARAGACH-2</u> : Battery gamma-roentgenometer	<u>2586-P</u>	1,000	470	2.1
	Detection unit: ionization chamber at end of a rod 1.5 meters (m) long	Chamber at end of a rod 1.82 m long			
	Measurement range: 0 to 100,000 microroentgens per second	0 to 250 roentgens per hour			
	Fundamental error in readings: ± 15 percent	± 10 percent			
	Continuous operation per set of batteries: 60 hours	350 hours			
Apparatus for measuring beta radiation	Dimensions: 1,800 x 120 x 110 mm	90 x 20 x 2,135 mm			
	Weight: 3.2 kg	3 kg			
	<u>IMA-1</u> : Intensimeter for tagged atoms	<u>1619A</u> : Labitron rate meter	2,650	403	6.6
	Detector: End-type counter	D34 thin mica windows, Geiger-Mueller (GM) counter, halogen quenched in P11 probe			
	Range: 0 to 200 counts per second	0 to 333			
"SENEZH": Beta and gamma radiometer	Subbands: 0 to 20, 0 to 200	0 to 8, 0 to 33, 0 to 83, 0 to 333			
	Fundamental error in readings: ± 20 percent				
	Detector: Gas counter	<u>2612M</u> : Count rate meter with P15 probe	800	255	3.1
	Range for gamma radiation: 0 to 20 milli- roentgens per hour	Glass-walled, self-quenching GM counter			
	Subbands: 0 to 0.4, 0 to 20				

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 7
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
Apparatus for measuring beta radiation	<u>"SENEZH"</u> : Beta and gamma radiometer (Continued) Dimensions: 260 x 115 x 175 mm Weight: 5.4 kg		255 x 120 x 135 mm 3.6 kg		
Apparatus for measuring alpha radiation	<u>P-349-2</u> : Scintillation alpha radiation attachment Detector: Scintillation-counter with photomultiplier Range: 0 to 6,400 counts per second Effectiveness: 50 percent Dimensions: length 298 mm, diameter 94 mm	<u>DS5-6</u> : Alpha scintillation detector DuMont 6292 photomultiplier with zinc sulphide-silver phosphor Length 350 mm, diameter 75 mm	1,390	515	2.7
Apparatus for measuring neutron fluxes	<u>RN-3 ("EFIR-1")</u> : Stationary radiometer for fast and thermal neutrons Detector: Photomultiplier with scintillation detectors Range: 0 to 52,500 neutrons per square centimeter per second Subbands for fast neutrons: 0 to 100; 0 to 350; 0 to 1,000; 0 to 3,500 Subbands for thermal neutrons: 0 to 1,500; 0 to 5,250; 0 to 15,000; 0 to 52,500 Fundamental error in readings: ± 20 percent Dimensions: 535 x 295 x 256 mm Weight 18 kg	<u>2112-N</u> : Survey meter Boron trifluoride probe with removable paraffin shield 0 to 45,000 Subbands for both fast and thermal neutrons: 0 to 450; 0 to 4,500; 0 to 45,000 ± 15 percent	6,200	655	9.5

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 7

USSR and US: Electronic Instruments (SIC Code 3611) -- Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
Scalers	B-2: Binary scaler	SC-19A utility scaler	2,300	495	4.6
	Counting system: binary Scaling factors: 1:1, 1:4, 1:16, and 1:64 Maximum counting speed: 6,400 counts per second Resolving time: 50 microseconds Variation in high tension for ± 10 percent change in line voltage: ± 1 percent Dimensions: 512 x 393 x 300 mm Weight: 20 kg	1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, and 1:128 7 ± 4 percent at 500 volts (v); ± 1 percent at 2,000 v			
	PS-10,000 ("FLOKS"): Scaling device	192A-P "Ultra-scaler": Decade	5,500	1,795	3.1
	Counting system: decimal Scaling factors: 1:1; 1:10; 1:100; 1:1,000; and 1:10,000 Pulse repetition rate: up to 850 kilocycles per second Resolving time (depending on the scaling factor): 1, 5, 25, 100, and 200 microseconds Limits of regulation of high voltage (under a current of 2 to 3 milliamperes): 700 to 2,500 v Instability of high voltage (for ± 10 percent change in line voltage): not more than ± 0.5 Dimensions: 520 x 397 x 464 mm Weight: 50 kg	1:10; 1:40; 1:100; 1:400; 1:1,000; 1:4,000; and 1:10,000 Up to 1 megacycle per second 1 microsecond maximum 500 to 5,000 v Less than 0.002 percent change for a 1 per- cent change in line voltage			

- 34 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 7
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
<u>Scalers</u> (Continued)	"VOLNA": Scaling apparatus	SC-TL: Compu/matic scaler	5,000	1,325	3.8
	Counting system: decimal Maximum counting speed: 80,000 counts per second Total counting capacity: 999,999 counts Resolving time: 5 microseconds Operating limits with automatic counting stop, 1,000; 10,000; and 100,000 counts High-voltage range: 300 to 2,200 v Weight: 30 kg	1 10; 30; 100; 300; 1,000; 3,000; 10,000; 30,000; 100,000; 300,000; and 900,000 500 to 2,500 v			
<u>Regulated rectifiers</u>	"TYUL'PAN": Intensimeter	162013-S: Analytical count ratemeter	2,000	595	3.4
	Range: 0 to 500,000 counts per second Subbands: 11 in number; from 0 to 5 to 0 to 500,000 counts per second Non-linearity: no greater than 3 Dimensions: 375 x 245 x 345 mm	0 to 16,666 counts per second 16 in number; from 0 to 150 to 0 to 1,000,000 counts per minute ± 2 percent			
<u>Regulated rectifiers</u>	VSM: Regulated high-voltage rectifier	SC-85: Tracermatic power supply	700	310	2.3
	Voltage range: 200 to 2,500 v Voltage regulation, for ± 10 percent change in line voltage: not more than ± 1 percent Dimensions: 280 x 160 x 160 mm Weight: 7 kg	500 to 5,000 v ± 0.02 percent			
<u>Regulated rectifiers</u>	"OREKh": Regulated high-voltage regulator	SC-86: Tracermatic power supply	4,000	410	9.8
	Voltage range: 2,500 to 5,000 v Voltage regulation, for change in line voltage of ± 10 v: ± 0.5 percent	500 to 5,000 v 0.02 percent change in output for -10 percent change in line voltage			

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 7

USSR and US: Electronic Instruments (SIC Code 3611) -- Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars	
<u>Signal generators</u>	<u>GSS-8</u> : Standard signal generator Frequency range, 50 kilocycles (kc) to 30 megacycles (mc)	General Radio type <u>1,001-A</u>	10,000	695 c/	18.0
	<u>GSS-12</u> : Standard signal generator Frequency range, 150 kc to 1,000 mc	Hewlett-Packard type <u>612-A</u>	13,800	850	16.2
<u>Q-Meters</u>	<u>KV-1</u> : Q-meter Frequency range, 50 kc to 50 mc	Boonton Radio type <u>260-A</u>	1,900	725	2.6
	<u>UK-1</u> : Q-meter Frequency range, 30 mc to 200 mc	Boonton Radio type <u>190-A</u>	1,760	625	2.8

a. The price is for 20 chambers and 1 charger-reader.

b. The price includes the charger.

c. The price is deflated by 20 percent to compensate for the greater frequency range of US equipment.

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 8

USSR and US: Radio and Television Receiving Sets (SIC Code 3651) -- Specifications,
Prices, and Ruble-Dollar Ratios
1955

Subcategory	Specifications (Designation/Description)		Price per Unit ^{a/}		Ruble-Dollar Ratio
	USSR	US	Rubles	Dollars ^{b/}	
Radio re- ceiving sets	"Moskvich," 4-tube radio receiver		191	15.95	12.0
	"ARZ," 4-tube radio receiver		269	21.95	12.3
	"Rekord," 5-tube radio receiver		321	39.95	8.0
	"Riga-6," 7-tube radio receiver		600	52.95	11.3
	"Mir," 11-tube radio receiver		1,950	229.95	8.5
Television receiving sets	"KVN-49," 16-tube television receiver, 7-inch screen		950	89.95	10.6
	"Avangard," 16-tube television receiver, 12-inch screen		1,800	155.00	11.6

a. Retail prices.

b. US prices based on manufacturer's estimate if identical sets were produced in the US in 1955.

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 9

USSR and US: Telephone and Telegraph Apparatus (SIC Code 3661) -- Specifications,
Prices, and Ruble-Dollar Ratios
1955

Subcategory	Specifications (Designation/Description)	Price per Unit		Ruble-Dollar Ratio
		Rubles	Dollars	
Telephones	USSR	US \$/*		
	BAGTA-50, ATS, F.411.10.06. Table type, plastic case for connection to subscriber lines of automatic telephone exchanges (ATS), with dial and connection socket	65	11.04	5.9
	TASG. Wall type in plastic case for connection to subscriber lines of ATS, with dial	160	8.95	17.9
	TAL. Pickup type with special holder for handset	200	24.15	8.3
	BAGTA-50, TsB, F.411.10.07. Table type in plastic case for connection to subscriber lines of central-battery manual telephone exchanges (TsB), with connection socket	50	8.99	5.6
	TAN-6. Table type in plastic case for connection to subscriber lines of TsB, with connection socket	83	8.99	9.2
	TAP-50. Wall type in aluminum alloy case, for TsB, with remote ringing device (howler) for calling and telephone contact with outside stations	300	49.25	6.1
	AMT. Wall-type pay phone in metal case, for connection to ATS, installed in public places for pay calls	850	54.10	15.7
	RMT. Wall-type pay phone, for TsB, for connection to subscriber lines of manual telephone exchanges	850	38.80	21.9

* Footnotes for Table 9 follow on p. 43.

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 9
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US \$/	Rubles	Dollars	
Telephones (Continued)	Explosion-proof wall type for mines, in lithium metal case, for local battery (MB) system	Aluminum housing, manual	300	119.00	2.5
	TASH-53. Moisture-proof wall type for mines, in lithium metal case, for TsB system	Aluminum housing, local battery system	420	95.00	4.4
Central-battery manual telephone exchanges and switchboards, type TsB x 3	URTS-100, RRL.220.020. Agency telephone exchange for 100 numbers		6,225	2,745.95	2.3
	URTS-200, RRL.220.021. As above, for 200 subscribers		12,900	2,999.45	4.3
	URTS-300, RRL.220.022. As above, for 300 subscribers		20,800	4,284.45	4.9
	URTS-400, RRL.220.023. As above, for 400 subscribers		27,000	4,538.45	5.9
	URTS-500, RRL.220.024. As above, for 500 subscribers		34,000	4,745.95	7.2
	URTS-600, RRL.220.025. As above, for 600 subscribers		41,500	4,999.45	8.3
	TsB-120. 120-number TsB x 2 switchboard for expanding existing and outfitting new TsB x 2 system telephone exchanges	200 lines	7,250	1,799.66 b/	4.0
Central-battery manual telephone exchanges and switchboards, type TsB x 2	TsB-240. 240-number TsB x 2 city telephone exchange for telephone connections between subscribers with central battery telephones	300 lines	17,750	3,427.56 b/	5.2
	TsB-360. As above, for 360 numbers	400 lines	34,900	4,084.60 b/	8.5

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 9

USSR and US: Telephone and Telegraph Apparatus (SIC Code 3661) -- Specifications,
Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US ^a /	Rubles	Dollars	
Central-battery manual tele- phone exchanges and switch- boards, type TsB x 2 (Continued)	TsB test device. For electrical checking of the subscriber line of a TsB city telephone exchange on the subscriber side and on the exchange side of the line Distributing frame. For installation of discharge strips and panels with test jacks, and for cross connection of wires with a two-wire line capacity as follows: 100 x 2 200 x 2 300 x 2 (Shch P-300) 400 x 2 (Shch P-400)		300 810 1,300 2,102 3,305	103.58 50.00 100.00 100.00 150.00	2.9 16.2 13.0 21.0 22.0
Automatic telephone exchanges	UATS-49. Agency automatic telephone exchange, 10-step system for 100 to 900 numbers (basic equip- ment) c/:				
	100 numbers	Complete package office	25,000	6,900.00	3.6
	200 numbers	Complete package office	44,500	9,500.00	4.7
	300 numbers	Complete package office	62,500	16,000.00	3.9
	400 numbers	Complete package office	79,000	18,500.00	4.3
	500 numbers	Complete package office	98,000	24,500.00	4.0
	600 numbers	Complete package office	117,000	27,000.00	4.3
	700 numbers	Complete package office	132,000	30,400.00	4.3
	800 numbers	Complete package office	151,000	33,000.00	4.6
	900 numbers	Complete package office	167,000	36,400.00	4.7

- 40 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 9
(Continued)

Subcategory	Specifications (Designation/Description)		Price per Unit		Ruble-Dollar Ratio
	USSR	US ^{a/}	Rubles	Dollars	
Automatic telephone exchanges (Continued)	Low-capacity, step-system, automatic telephone ex- changes:				
	<u>UATS-50.</u> 50-number agency automatic telephone exchange	60 lines	16,000	3,337.25 ^{b/}	4.8
	<u>ATS-33.</u> As above, for 33 numbers	40 lines	11,000	3,092.76 ^{b/}	3.6
	<u>ATS-VRS.</u> Relay-system terminal automatic tele- phone exchange for 40 numbers. Operates as terminal exchange for intrarayon and internal communications. Normal operation of ATS-VRS is guaranteed from a direct current (DC) source of 60 volts. The maximum capacity of the exchange is 40 numbers, with provision for connecting 35 subscriber lines (30 individual lines and 5 lines with twin phones). Two-digit numbering of sub- scribers. The 40-number ATS-VRS can be operated jointly with both ATS-VRS system exchanges and with local-battery and central-battery system manual telephone exchanges over two-wire con- necting lines. The exchange is designed in a floor-type cabinet. The exchange consists of blocking devices, discharge strip, line trans- formers, control instruments, spare parts, and technical documentation.		20,000	3,795.00	5.3
Equipment for high-frequency communications	<u>OKS.</u> One-channel, high-frequency telephone appar- atus, terminal type		10,500	587.50	17.9
	<u>OKSF.</u> As above, intermediate type		10,000	389.60	25.7
	<u>OV-3.</u> Three-channel, high-frequency telephone apparatus, terminal type		32,000	2,401.60	13.3
	<u>PV-3.</u> As above, intermediate type		23,000	3,450.00	6.7

S-E-C-R-E-T

Table 9

USSR and US: Telephone and Telegraph Apparatus (SIC Code 3661) -- Specifications,
Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)	Price per Unit		Ruble-Dollar Ratio
		Rubles	Dollars	
Line equipment room apparatus	PTN. Voice-frequency dialing receiver	2,300	123.00	18.7
Auxiliary equipment for long-distance communications apparatus	OPS-DPS. Intermediate-exchange amplifying equipment (TU-RP, 0213.001, 1955). For increasing the communications range of a 12-channel system of high-frequency telephony over aerial communications lines. Price quoted is for one rack.	26,000	4,567.00	5.7
	SDK. Channel-division rack (TU, RP, 2133000, 1955). For dividing the channels of V-12 (12-channel) apparatus having an effective transmission range of 300 to 3,400 cycles into two channels with a range of 300 to 1,700 cycles each. Price quoted is for one rack which divides 12 channels.	45,000	4,803.00	9.4
	Intermediate amplifier without automatic gain control (TU, MRTP b/Wo. 1955). For installation in unattended repeater points on cable trunk lines equipped with K-24 (24-channel) apparatus. Produced with a duplicate set of tubes which are switched into the circuit when the main set goes out of order. Produced in the following three versions: (a) with equalizers to compensate for frequency distortion in 1.5-kilometer (km), 3-km, and 6-km lines; (b) with equalizers to compensate for frequency distortion in 1.5-km, 3-km, and 12-km lines; and (c) with equalizers to compensate for frequency distortion in 6-km and 12-km lines. Price quoted is for one plate.	3,000	539.20	5.6

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 9
(Continued)

Subcategory	Specifications (Designation/Description)	Price per Unit			Ruble-Dollar Ratio
		Rubles	Dollars	US \$/Rubles	
Telegraph equipment	ST-35. Telegraph type-printing apparatus, start-stop type. Equipped with ASchch-49 equipment panel, spare parts, and instruments.	2,900	1,133.90		2.6
	STA. Telegraph type-printing automatic apparatus, start-stop type. Equipped with ASchch-49 equipment panel. Outfitted with filters for radio noise suppression, spare parts, and instruments.	6,000	1,149.30		5.2
	STA-7.42. As above, but with contact division 7.42.	6,000	1,149.30		5.2
	T-50. Start-stop transmitter. Equipped with tuning forks for speed adjustment and with spare parts and instruments.	7,000	521.00		13.4
	P-1. Perforator. Equipped with radio noise suppression device.	2,450	643.00		3.8
	Complete unit of radio telegraph apparatus, consisting of a T-2 transmitter, a K-2 bracket for used tape, and three coils of K-5 perforated tape. Equipped with radio noise suppression device.	950	159.90		5.9

- a. The respondent did not, in general, provide designations or descriptions of its equipment except for instances of significant disparity between the technical or functional characteristics of Soviet and US equipment.
- b. To compensate for the differential in line capacity between Soviet and US equipment, the US prices were deflated to allow for the greater line capacity of US equipment.
- c. The Soviet price handbook contains an extensive list of UATS-49 constituent components and subassemblies. This list was used by the respondent in the technical evaluation of Soviet exchanges, but US prices were not provided.

S-E-C-R-E-T

Table 10

USSR and US: Radio and Television Communication Equipment (SIC Code 3662) --
Specifications, Prices, and Ruble-Dollar Ratios
1955

Subcategory	Specifications (Designation/Description)	Price per Unit		Ruble-Dollar Ratio
		Rubles	Dollars	
Microwave radio relay equipment, "Strela" type S/	Transmitting rack of "Strela T" radio relay apparatus. Designed for television radio relay lines up to 300 kilometers (km). Rack includes a television receiver and a transmitting installation for the decimeter frequency range (1,770 to 1,955 db). Rack is installed in terminal points of radio relay lines where programs are received from a relay television center.	40,000	6,874.00	5.8
	Receiving rack of "Strela T" radio relay apparatus (TU MS 56). Designed for television radio relay lines up to 300 km in length. Rack includes receiving installation for decimeter frequency range (1,770 to 1,995 mc) and a linear video amplifier. Rack is installed in terminal points of the	40,000	7,152.00	5.6

a. "Strela T" and "Strela M" radio relay apparatus. "Strela T" is designed exclusively for television service, and "Strela M" is designed to transmit the band of frequencies generated by the K-24 multiplexer. For television relay service, two high-frequency channels -- video and audio -- are used. Audio channel also provides service communications and duplex multichannel communications when used with multiplexing equipment. For telephone service, 24 high-quality telephone channels are provided as well as a service circuit and capacity for transmitting the audio component of the television signal (either with or without multiplexing equipment). For increased reliability, automatic standby facilities are provided. "Strela" apparatus operates with a periscopic antenna system. In locations where periscopic antenna is not practical, conventional parabolic antenna with driven element and coaxial feeder may be used. Antennas of opposite polarization are used for receiving and for transmitting. Technical characteristics of "Strela" equipment are as follows:

Distance between stations: 25 to 40 miles (US, 20 to 40 miles)
Transmitter power output: 2 watts (w) (minimum)
Frequency: 1,770 to 1,955 mc (US, 3,700 to 4,200 mc)
Frequency deviation: 7 mc
Receiver sensitivity: 200 millivolts (mv)
Receiver bandpass: 12 mc (US, 20 mc)

Accuracy of receiver autotuning: 150 kilocycles (kc)
Video amplifier bandwidth: 6 megacycles (mc)
Antenna gain: 30 decibels (db)
Power supply: 220-volt (v) regulated
Power consumption per unit (receiver, transmitter, or line video amplifier): 700 to 1,100 w

S-E-C-R-E-T

Table 10
(Continued)

Subcategory	Specifications (Designation/Description)	Price per Unit		Ruble-Dollar Ratio
		Rubles	Dollars	
Microwave radio relay equipment, "Strela" type 2/ (Continued)	USSR			
	radio relay line where the television signal is separated for transmission to relay television centers.			
	Intermediate rack of "Strela T" radio relay apparatus (TU MS 56). Designed for television radio relay lines up to 300 km long. Rack is a receiving-transmitting installation for the decimeter frequency range (1,770 to 1,955 mc) and is designed for installation in intermediate points of the line.	40,000	5,564.00	7.2
	Shunting rack of "Strela T" radio relay apparatus (TU MS 56). Shunting rack includes a modulation video amplifier and a transmitting installation for the decimeter frequency range (1,770 to 1,955 mc). Rack is installed in intermediate points where transmission of the television program is required over several routes.	40,000	4,473.30	8.9
	High-frequency rack of "Strela M" radio relay apparatus for terminal station (TU MS 56). Designed for radio relay trunk lines up to 2,500 km long, with 24 telephone channels. Rack is a receiving-transmitting installation for the decimeter frequency range (1,770 to 1,955 mc) and is designed for installation in terminal points and also in intermediate points where television channels are separated.	32,000	6,135.00	5.2
	Receiving-transmitting radio apparatus for "Strela M" system intermediate station (TU MS 262-54). Designed for trunk lines up to 2,500 km long, with 24 telephone channels. The rack is a receiving-transmitting installation for the decimeter frequency range (1,770 to 1,955 mc) and is designed for installation in intermediate points where television channels are not separated.	30,000	5,564.00	5.4

- 45 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 10

USSR and US: Radio and Television Communication Equipment (SIC Code 3662) --
Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications	Price per Unit		Ruble-Dollar Ratio	
	(Designation/Description)				
	USSR	US	Rubles		Dollars
Television and radio trans- mitting equip- ment	Standard ultrashort-wave (VHF) television station, 5/2.5-kilowatt (kw) output (VTU, MPSS, b/No. 1951). For television broadcasting via transmission of a black-and-white image with a definition of 625 lines at 50 half-frames per second and frequency modulation (FM) sound. Station can be manufactured for operation on any of five frequency channels in the 48.5 to 100 mc range. The station assembly consists of the following items:	RCA TT-6AL transmitter, including sideband filter, notch duplexer, antenna, and feeder system (transmission line and spare parts)	800,000	92,500.00	8.6
	1. Ultrashort-wave (VHF) television transmitter with factory adjustment		(230,400)		
	2. VHF audiotransmitter		(133,800)		
	3. Plate rectifier and relay panel installation		(53,300)		
	4. Three-panel power board		(35,500)		
	5. Dummy antenna installation		(11,000)		
	6. Control panel		(73,100)		
	7. Antenna-feeder installation		(109,800)		
	8. Water-cooling system		(24,200)		
	9. Cabling assembly		(14,800)		
	10. Ripple filter installation		(29,900)		
	11. VHF filter installation		(52,300)		
	12. Spare parts		(31,900)		
	(The cost of complete adjustment, tuning, and installation is not included in the price of the station.)				
	"Blesna KV" short-wave radio transmitter. For ship installation; continuous range in the frequency band from 4,000 to 22,720 kc; output, 250 w	RCA ET8052	42,000	4,525.00	9.3
	"Blesna SV" medium-wave radio transmitter. For ship installation; continuous range in the frequency band from 365 to 550 kc; output, 250 w	RCA ET8051	35,000	4,525.00	7.7

- 46 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 11

USSR and US: Radio and Television Receiving-Type Electron Tubes (SIC Code 3671) --
Specifications, Prices, and Ruble-Dollar Ratios
1955

Subcategory	USSR	Specifications (Designation/Description)		US	Price per Unit		Ruble-Dollar Ratio
		Filament Voltage (Volts)	Filament Current (Amperes)		Rubles	Dollars	
Receiving type	Diodes						
	6D4Zh. Diode. Radio- frequency type, indirectly heated cathode, acorn size	6.3	0.15	RCA9006	9	1.00	9.0
	6Xh6S. Duodiode. Indirectly heated cathode, glass structure	6.3	0.3	RCA6H6-G	5	0.55	9.1
	Triodes						
	2S4S. Triode. Output type, directly heated cathode, glass structure, four-prong base	2.5	2.5	RCA2A3	15	1.28	11.7
	6S1Zh. Triode. Radio-fre- quency type, indirectly heated cathode, acorn size	6.3	0.15	RCA955	15	2.10	7.1
	6F5M. Triode. Indirectly heated cathode, glass structure	6.3	0.3	RCA6F5GT	7.5	0.65	11.5
	Double triodes						
	6N7S. Double triode. Output type, indirectly heated cathode, glass structure, octal base	6.3	0.81	RCA6N7GT	6	0.85	7.1

- 47 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 11

USSR and US: Radio and Television Receiving-Type Electron Tubes (SIC Code 3671) --
Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	Specifications (Designation/Description)	Filament Voltage (Volts)	Filament Current (Amperes)	US	Price per Unit		Ruble-Dollar Ratio
					Rubles	Dollars	
Receiving type (Continued)	Radio-frequency (RF) pentodes						
	6Zh1Zh. Pentode. RF type, indirectly heated cathode, acorn size	6.3	0.15	RCA954	22	3.70	5.9
	6Zh7. Pentode. RF type, in- directly heated cathode, metal structure	6.3	0.3	RCA6J7	7	0.72	9.7
	6K1Zh. Pentode. RF type, indirectly heated cathode, acorn size	6.3	0.15	RCA956	24	3.80	6.3
	12K4. Pentode. RF type, indirectly heated cathode, metal structure, octal base	12.6	0.15	RCA12K7GT	7.5	0.71	10.6
	6K7. As above	6.3	0.3	RCA6K7	7	0.71	9.9
	Pentodes and beam power tet- todes, output types						
	6P3S. Tetrode. Beam power, output type, indirectly heated cathode, glass struc- ture, octal base	6.3	0.9	RCA6L6-G	8.7	1.00	8.7
	6P6S. As above	6.3	0.45	RCA6V6-GT	7	0.52	13.5
	6P9. Pentode. Output type, indirectly heated cathode, metal structure, octal base	6.3	0.65	RCA6AG7	9	1.00	9.0
	6F6M1. Pentode. Audio- frequency (AF) output type, indirectly heated cathode, glass structure, octal base	6.3	0.7	RCA6F6-G	6	0.60	10.0

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 11
(Continued)

Subcategory	Specifications (Designation/Description)	Filament Voltage (Volts)	Filament Current (Amperes)	US	Price per Unit		Ruble-Dollar Ratio
					Rubles	Dollars	
Receiving type	USSR						
	Pentodes and beam power tet- todes, output types (Continued)						
	6P6S. As above	6.3	0.7	RCA6P6-GT	5	0.60	8.3
	12P4S. Pentode. Beam power, output type, indirectly heated cathode, glass structure, octal base	12.6	0.15	RCA12A6	20	1.02	19.6
	Heptodes						
	6A7. Heptode. Remote cutoff characteristic, indirectly heated cathode, metal struc- ture, octal base	6.3	0.3	RCA6A7	7	0.66	10.6
	6L7. Heptode-mixer. RF type, indirectly heated cathode, metal structure, octal base	6.3	0.3	RCA6L7	9.5	0.88	10.8
	Diode-pentodes						
	6BP6. Diode-pentode. Double, indirectly heated cathode, glass structure, octal base	6.3	0.3	RCA6B8	6.5	0.88	7.4

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 12

USSR and US: Cathode Ray Type Electron Tubes (SIC Code 3672) --
Specifications, Prices, and Ruble-Dollar Ratios
1955

Subcategory	USSR	Specifications (Designation/Description)		US	Price per Unit		Ruble-Dollar Ratio
		Filament Voltage (Volts)	Filament Current (Amperes)		Rubles	Dollars	
Cathode ray tubes	<u>Oscillograph</u>						
	8L029. Electrostatic focusing, screen diameter 8 centimeters (cm), green screen glow	6.3	0.6	RCA3BP1-A	50	10.95	4.6
	13L037. Electrostatic focusing, screen diameter 13 cm, green screen color	6.3	0.6	RCA5BP1-A	90	14.25	6.3
	5L038. As above, screen diameter 5 cm	6.3	0.6	RCA2BP1	50	6.95	7.2
	13LM31. Magnetic focusing, screen diameter 13 cm, yellow-orange screen color	6.3	0.6	RCA5FP7-A	130	16.00	8.1
	31LM32. As above, screen diameter 31 cm	6.3	0.6	RCA12DP7-A	450	45.00	10.0
	18LM35. As above, screen diameter 18 cm	6.3	0.6	RCA7BP7-A	200	25.30	7.9
	<u>Kinescope</u>						
	18K15 (LK-715A). Magnetic focusing, screen diameter 18 cm, white screen glow	6.3	0.55	7GP4 (also 7JP4, 7BP4, 7QP4, and 7MP4 are equivalent)	70	12.50	5.6
	18K4B. As above	6.3	0.6	7GP4	70	12.50	5.6
	18K5B. As above	6.3	0.56	8FP4	70	14.00	5.0
	<u>Television transmitting</u>						
	L1-7. Television transmitting tube, magnetic transfer of electronic image, electromagnetic and magnetic focusing	12.6		RCA5820	4,500	990.00	4.5

- 50 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 13

USSR and US: Transmitting, Industrial, and Special-Purpose Electron Tubes (SIC Code 3673) --
Specifications, Prices, and Ruble-Dollar Ratios
1955

Subcategory	Specifications (Designation/Description)			US	Price per Unit		Ruble-Dollar Ratio
	USSR	Filament Voltage (Volts)	Filament Current (Amperes)		Rubles	Dollars	
Electron tubes: transmitting, industrial, and special purpose	<u>Transmitting triodes</u>						
	G-811. Triode. Low-output transmitting type, directly heated cathode	6.3	4	RCA811-A	50	2.95	16.9
	G-484. Triode. Transmitting type, forced air cooling	22	59.5	RCA891R	1,500	305.50	4.9
	<u>Transmitting tetrodes and pentodes</u>						
	G-837. Pentode. Transmitting type, indirectly heated cathode	12.6	0.7	RCA837	18	3.85	4.7
	G-1625. Tetrode. Beam power, indirectly heated cathode, glass structure	12.6	0.45	RCA1625	18	1.82	9.9
	G-807. As above	6.3	0.9	RCA807	12	1.74	6.9
	<u>Kenotrons</u>						
	1Ts78. Kenotron. Single plate, high voltage, directly heated cathode, glass structure octal base	1.25	0.2	RCA1B3-GT	18	0.68	26.5
	<u>Magnetrons</u>						
	MI-500. Pulse packet type. Filament voltage, 6.3 volts (v). Plate voltage, 14 kv. Average plate current, 20 ma. Average output, 80 w. Frequency of generated oscillations, 9,550 megacycles (mc)			RK-6967. Anode voltage, 15 kilovolts (kv); average plate current, 13.5 milliamperes (ma); average power output, 75 watts (w)	570	450.00	1.3

- 51 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 13

USSR and US: Transmitting, Industrial, and Special-Purpose Electron Tubes (SIC Code 3673) --
Specifications, Prices, and Ruble-Dollar Ratios
1955
(Continued)

Subcategory	USSR	Specifications (Designation/Description)		US	Price per Unit		Ruble-Dollar Ratio
		Filament Voltage (Volts)	Filament Current (Amperes)		Rubles	Dollars	
Electron tubes: transmitting, industrial, and special purpose (Continued)	<u>Special tubes</u>						
	1506. Tetrode. Double-beam power type, indirectly heated cathode, ruggedized	12.6	1.125	RCA829-B	230	11.35	20.3
	1509. As above	12.6	0.8	RCA832A	220	8.20	26.8
	VG-1/8500. Gaseous rectifier, oxide coated, directly heated cathode, mercury filled	2.5	5	RCA866A	20	1.55	12.9
	<u>Thyratrons</u>						
	TG-1-5/3. Thyratron. Directly heated cathode, filled with inert gas	5	19	RCA869B	200	111.00	1.8
	<u>Regulators</u>						
	SG28. Voltage regulator	75 a/	5 to 40 b/	RCA OA3	9	0.82	11.0
	SG38. As above	105 a/	5 to 40 b/	RCA OC3	8	0.80	10.0
	SG48. As above	150 a/	5 to 30 b/	RCA OD3	8	0.77	10.4
	<u>Phototubes and photoelectronic multiplier tubes</u>						
	TsG-1. Phototube, gas filled, oxycesium cathode. Minimum			RCA921	11	1.65	6.7

a. Regulated voltage (volts).
b. Regulated current (milliamperes).

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 13
(Continued)

Subcategory	USSR	Specifications (Designation/Description)		US	Price per Unit		Ruble-Dollar Ratio
		Filament Voltage (Volts)	Filament Current (Amperes)		Rubles	Dollars	
Electron tubes: transmitting, industrial, and special purpose	<u>Phototubes and photoelectronic multiplier tubes</u> (Continued)						
	sensitivity: 75 microamperes (microamps)/lumen. Maximum dark current, 10-7 amperes (amps)						
	STsV-6. Phototube, vacuum type, antimony-cesium cathode. Oper- ating section of photocathode at least 30 x 15 millimeters (mm) Dark current with plate voltage of 30 v, no more than 5 x 10-11 amps			RCA 6570	65	4.80	13.5
	TsV-4. Phototube, vacuum type, cesium cathode. Operating voltage, 240 v. Minimum sensitivity, 20 microamps/lumen. Maximum dark current, 10 to 7 amps			RCA925	15	1.75	8.6
	TsV-3. As above. Minimum starting integral sensitivity, 20 microamps/ lumen			RCA 7043 (this type not introduced by RCA until June 1957)	10	2.65	3.8
	FEU-19. Photoelectronic multiplier tube, multistage, antimony-cesium cathode, electrostatic focusing. Rated voltage, 1,250 v. Maximum dark current, 10 to 8 amps			RCA 6199	140	36.40	3.8

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Table 14

USSR and US: Electronic Components (SIC Code 3679) --
Specifications, Prices, and Ruble-Dollar Ratios
1955

Specifications (Designation/Description)										
USSR										
Subcategory	High-Frequency Molded Mica	DC Test Voltage (Kilovolts)	Rated Capacitance, ± 5 Percent (Microfarads)	Millimeters			US ^a / _*	Price per Unit		Ruble-Dollar
				Diameter	Width	Height	Type	Rubles ^b / _*	Dollars ^c / _*	Ratio
Capacitors, Type	1KV-1	17.5	0.0001	87	124	67	2510-51	105	42.00	2.5
KV	2KV-100	3	0.1	87	124	107	2921-52	175	92.00	1.9
	3KV-2.2	18	0.0022	106	144	69	2523-52	125	77.00	1.6
	3KV-1	20	0.001	106	144	69	2510-51	135	42.00	3.2
	3KV-0.39	20	0.00039	106	144	69	2469-51	100	42.00	2.4
	4KV-300	3	0.3	106	144	109	2469-56	300	192.00	1.6
	4KV-70	5	0.07	106	144	109	2469-56	310	192.00	1.6
	4KV-50	5	0.05	106	144	109	1119-52	255	92.00	2.8
	4KV-30	7.5	0.03	106	144	109	1119-56	275	192.00	1.4
	4KV-20	7.5	0.02	106	144	109	1330-52	240	108.00	2.2
	4KV-10	12.5	0.01	106	144	109	430-52	275	92.00	3.0
	5KV-0.47	55	0.00047	106	144	109	430-57	340	176.00	1.9
	6KV-10	10	0.01	124	163	70	2890-52	225	92.00	2.4
	6KV-1.8	20	0.0018	124	163	70	2457-51	265	42.00	6.3
	6KV-1.5	20	0.0015	124	163	70	239-51	240	52.00	4.6
	6KV-1.2	20	0.0012	124	163	70	243-51	215	49.50	4.3
	6KV-0.22	20	0.00022	124	163	70	2443-51	250	42.00	6.0
	7KV-100	5	0.1	124	163	110	767-52	380	92.00	4.1
	7KV-50	7.5	0.05	124	163	110	687-75A	490	255.00	1.9
	7KV-20	12.5	0.02	124	163	110	1581-56	500	212.00	2.4
	7KV-10	17.5	0.01	124	163	110	1583-57	500	192.00	2.6
	7KV-2.2	35	0.0022	124	163	110	2981-56	550	160.00	3.4
	7KV-1.8	37	0.0018	124	163	110	2979-56	525	160.00	3.3
	7KV-0.5	41	0.0005	124	163	110	1217-57	410	179.00	2.3
	8KV-2.2	41	0.0022	124	163	140	676-57	730	190.00	3.8
	8KV-2	41	0.002	124	163	140	676-57	760	190.00	4.0
	9KV-10	25	0.01	124	163	170	UC 3248	750	680.00	1.1

* Footnotes for Table 14 follow on p. 55.

- 54 -

S-E-C-R-E-T

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

Sanitized - Approved For Release :
CIA-RDP79S01046A000900040001-8

S-E-C-R-E-T

Table 14
(Continued)

Specifications (Designation/Description)										
USSR										
Subcategory	High-Frequency Molded Mica	DC Test Voltage (Kilovolts)	Rated Capacitance, ± 5 Percent (Microfarads)	Millimeters			US	Price per Unit		Ruble-Dollar Ratio
				Diameter	Width	Height	Type	Rubles a/	Dollars b/	
Capacitors, Type KB	2KB-10-5	10	0.01	82	92	111	2590-52	95	92.00	1.0
	5KB-40-5	10	0.04	102	133	119	782-57	370	192.00	1.9
	5KB-50-5	10	0.05	102	133	119	782-57	395	192.00	2.1
	5KB-60-5	10	0.06	102	133	119	782-57	405	192.00	2.1
	6KB-10-7.5	15	0.01	92	153	113	430-52	235	92.00	2.6
	6KB-10-14	21	0.01	92	153	113	UC 3236	410	365.00	1.1
Capacitors, Type POS, plastic film	Nonhermetically sealed, fixed capacitance of 100, 200, and 390 pico- farads, 400 volts DC operating voltage						PS 1/4 x 13/16	2.4	0.205	11.7
Capacitors, Type KEG-1, electro- lytic	Hermetically sealed, metallic rectangular case 46 x 26 x 18 mm, operat- ing voltage of 300 volts DC with capacitance of 5 microfarads, at tem- perature of -40° to +60° centigrade						Nonhermetically sealed AVL 5/300	4.1	0.902	4.5

a. Price as of 1 July 1956.

b. Price in 1955.

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX B

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this research aid. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

Except for CIA finished intelligence, all sources are evaluated RR 2 unless otherwise indicated.

1. Bureau of the Budget. Standard Industrial Classification Manual, Washington, 1957. U.
2. CIA. CIA/RR ER 60-16, 1955 Ruble-Dollar Price Ratios for Intermediate Products and Services in the USSR and the US, Jun 60. U.

S-E-C-R-E-T

S-E-C-R-E-T

3. RAND Corporation. RM-1443, A Comparison of 1950 Wholesale Prices in Soviet and American Industry, by Norman M. Kaplan and William L. White, 1 May 55. U.
Ibid., RM-2432, Prices of Producers' Durables in the United States and the USSR in 1955, by Abraham S. Becker, 15 Aug 59. U.
4. Bureau of the Census. Bulletin MC58(2)-36D, Communication Equipment, Including Radio and TV and Electronic Components and Accessories, 1958. U.
Ibid., Bulletin MC(P)-36-A-6, Electrical Measuring Instruments Industry, 1958. U.
Ibid., Bulletin MC(P)-35-E-3, Computing and Related Machine Industry, 1958. U.
5. Bureau of the Budget. Standard Industrial Classification Manual, Washington, 1957. U.
6. Bureau of the Census. Bulletin MC58(2)-36D (4, above), Tables 5B and 6A, p. 14-22. U.
7. Ibid., Bulletin MC(P)-35-E-3 (4, above), Table 3, p. 4. U.
8. Ibid., Bulletin MC(P)-36-A-6 (4, above), Table 3, p. 4. U.
9. CIA. CIA/RR 59-10, The Electronics Industry in the USSR, 1950-60, Apr 59, p. 21. S.
10. USSR. Spravochnik tsen na stroitel'nyye materialy i oborudovaniya (Handbook of Prices on Construction Materials and Equipment), Moscow, 1956, pt II, p. 815-854. U.
11. Ibid., pt IV, p. 579-595. U.
12. Shkurin, G.P. Spravochnik po elektroizmeritel'nym i radio-izmeritel'nym priboram (Handbook on Electrical Measuring and Radio Measuring Instruments), Moscow, 1956. U.
13. USSR. Spravochnik po dozimetricheskim, radiometricheskim i elektronno-fizicheskim priboram, schetchikam, stsintillyatoram i fotoumnozhitelyam (Handbook on Dosimetric, Radiometric, and Electron-Physics Apparatus, Counters, Scintillators, and Photo Multipliers), Moscow, 1959. U.
14. Nove, A. "Some Notes on Soviet National Income Statistics," Soviet Studies, no 3, Jan 55, p. 263. U.
15. USSR. Spravochnik tsen na stroitel'nyye materialy i oborudovaniya (Handbook of Prices on Construction Materials and Equipment), Moscow, 1956, pt II, p. 815. U.
16. RAND Corporation. RM-1443 (3, above), p. 11. U.
17. Nove, op. cit. (14, above), p. 262. U.
18. Vestnik svyazi, no 8, 1956, p. 13. U.
19. CIA. CIA/RR 59-10 (9, above), Table 9, p. 48. S.
20. USSR. Transport i svyazi, SSSR, statisticheskiy sbornik (Transport and Communications of the USSR, a Statistical Compilation), Moscow, 1957. U.
21. CIA. CIA/RR ER 60-5, Capital Investment in Post and Telecommunications in the USSR, 1951-65, Feb 60. S.
22. CIA. CIA/RR 59-34, The Electron Tube Industry of the USSR, 1955-60, Aug 59, Table 8, p. 32. S.
23. Radio, no 7, Jul 56, p. 3. U. Eval. Doc.

S-E-C-R-E-T

S-E-C-R-E-T

24. Kondrashev, D.D. Tsenoobrazovaniye v promyshlennosti SSSR
(Price Formation in Industry in the USSR), Moscow, 1956,
p. 49. U.
25. CIA. EIC-ETSC-WPI, Microwave Radio Relay and Coaxial Cable in
the Soviet Bloc -- Plans, Progress, and Problems, 15 Feb 61,
p. 4. S.

S-E-C-R-E-T

Sanitized - Approved For Release : CIA-RDP79S01046A000900040001-8
SECRET

SECRET
Sanitized - Approved For Release : CIA-RDP79S01046A000900040001-8

Analyst: 25X1A9a MS/EE

Sanitized - Approved For Release : CIA-RDP79S01046A000900040001-8
OFFICE OF RESEARCH AND REPORTS

Control Staff

Control Sheet

Series Number CIA/RR A.ERA 62-8
Date of Document October 1962

Classification **SECRET**
Number of Copies 230

GROUP 1
Excluded from automatic
downgrading and
declassification

Copy No.	Recipient	Date	Returned
1	AD/RR	9 Nov 62	4 Dec 63
2	DDI	"	
3	St/P/C file copy 25X1A6a	"	
61 - 88	Rec'd in St/P/C	14 Nov 62	
61		16 Nov 62	
62		"	
63		"	
64 25X1X7		NOT SENT	
65 - 68		19 Nov 62	
69		"	
70 - 72		"	
73	NORAD via AFCIN	"	
74 25X1X7		"	
75 80		"	
76 - 78		NOT SENT	
79 - 88	Filed in St/P/C	15 Nov 62	
3 25X1A9a	Received from St/P/C	16 Nov 62	
25X1A9a		16 Nov 62	
81		23 Nov 62	
82		3 Dec 62	
83 25X1X7	via OCK	6 Dec 62	
84	Received via St/P/C 25X1A9a	18 Dec 62	
31 32, 76, 77, 78	DTA via WS/CR	27 Dec 62	
39	Records Center	31 Dec 62	
84	Received in St/P/C	28 Jan 63	
39 85	Director Strategic Target Planning Attache, Economic Unit, SSTRS, SSTRS Office AFB, Nebraska	18 Jan 63	
25X1A9a	Records Center	16 Dec 63	
87-88	Ex 1 for DTAAP-IR4	6 Nov 64	
	RC	11 Jan 65	

Sanitized - Approved For Release : CIA-RDP79S01046A000900040001-8